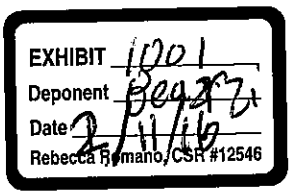

EXPERT REPORT

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I. QUALIFICATIONS

I graduated from the University of Padova, Italy, with a B.S. in Natural Science. In 2003, I received my Ph.D. in Biology from the University of California, Los Angeles and, a year later, completed a Postdoctoral Fellowship in Education, also at UCLA. My Ph.D. thesis was based on six-years of field studies conducted in Southern California waters on the behavioral ecology of different species of marine mammals, including killer whales. My research interests have been - and still are - mainly focused on marine mammal behavioral strategies and the relationship between species and their environment, as well as pressing conservation issues facing marine mammals in the wild. In recent years, my interests have also included dolphins kept in captivity.

Since the early '90s, I have organized, directed and managed numerous marine mammal research, conservation and educational projects in diverse locations (Mediterranean Sea, Caribbean Sea, Gulf of Mexico, Pacific Ocean, etc.), supervising students, eco-volunteers and research staff and teaching at different levels in and out of the classroom. From 1991 to 1999, I was the Principal Investigator for ecological and conservation research on dolphins and sea turtles in Yucatan, Mexico, teaching students about behavioral ecology, marine biology, and applied conservation. In the Mediterranean Sea, I supervised and conducted various research projects that included the first abundance and distribution cetacean study off the coast of Greece. Throughout my work, I have interacted with scientists from different disciplines and have studied a broad variety of marine mammal species.

In 1996, I organized the Los Angeles Dolphin Project, the first long-term comprehensive marine mammal and conservation study ever conducted in the Santa Monica Bay, California. Two years later, I co-founded the 501(c)(3) non-profit Ocean Conservation Society (OCS), which aims to conduct scientific research and educational outreach programs leading to the protection and conservation of our oceans. As OCS President and Research Director, I developed and supervised dolphin and whale research as well as the development and implementation of environmental education and public outreach programs. My field studies off California have focused mostly on the species frequenting this study area on a regular basis: bottlenose dolphins, common dolphins, Pacific white sided-dolphins, large whales (Minke, fin, gray, etc.) and California sea lions. However, other species such as killer whales, Risso's dolphins, Dall's porpoises, blue whales, etc. have also been investigated and included in my research, reports and peer-reviewed publications. These investigations off Southern California represent one of the longest-running marine mammal studies conducted along the West Coast of the United States and worldwide. Over time, my research has evolved to follow a more comparative and action-oriented conservation approach. I believe that field biologists no longer have the luxury of conducting research without keeping conservation in mind and without considering the linkages that exist between different species and their collective habitat. Current research interests include, for instance, skin lesions and physical deformities on dolphins and potential implications for human health. As President of OCS, I recently received a commendation from the City of Los Angeles for our outstanding research and educational work.

I have lectured extensively to students of various ages and backgrounds on marine mammals, marine ecology, conservation and environmental education. I have also given numerous book talks and presentations as a guest speaker both in and outside of academia, and led workshops and seminars for both scientists and the general public in several different countries. My talks, workshops and seminars have included the subject of dolphins kept in captivity. My current work at OCS required that I remain up-to date with current studies and scientific publications on marine mammals, behavioral ecology, marine biology and environmental and other critical issues facing us today. Through OCS, I have also collaborated with many research institutes and universities (e.g., UCLA, UCSD, USC, Scripps Institute of Oceanography, etc.) on diverse research, conservation & management projects focusing on various species of marine mammals, MPA's and fishery issues.

I have worked extensively with other organizations and schools from K-12 to universities for the production of environmental curricula, scientific mentorship programs and other activities involving students in a hands-on approach to biology, ecology, conservation and environmental education.
At UCLA and UCLA Extension, I authored and taught major and non-major courses. Among other subjects, I taught marine biology, oceanography, ecological concepts, marine mammal courses (including the subject of captivity) as well as more specific current environmental issues faced by humanity, approaching the subject from different perspectives (social, economical, scientific, political, etc.). I acted as advisor and mentor for many student research internships and mentorships involving undergraduate and graduate students in my marine mammal field research and in the lab. During the years as a student in the Department of Ecology and Evolutionary Biology at UCLA, I was honored with several grants, awards, and fellowships.

In addition to many peer-reviewed publications as a single or first author, I co-authored the book "Beautiful Minds: The Parallel Lives of Great Apes and Dolphins" with Dr. Craig Stanford (Harvard University Press, 2008, paperback 2010) and authored the book "Dolphin Confidential: Confessions of a Field Biologist" (Chicago University Press, 2012). "Dolphin Confidential" won the Green Book Award in the Animal Section. In both books, I talk about dolphin intelligence and social complexity, and discuss killer whale societies and some of the issues that captivity raises.

I have broad experience as a photojournalist and have written hundreds of articles for local and national European and U.S. publications on marine mammal, ecology, conservation and nature in general. My research work and books have been covered, among many others, by CNN, KPCC, PRI, CBS2/KCAL9, NBC4, Hallmark Channel, Los Angeles Times, New Scientist, American Scientist, and The Huffington Post. I am currently an official blogger for The National Geographic – *Ideas and Insight from Explorers*. I have discussed my research work, and the subject of dolphin social complexity and their intelligence as well the issues with keeping these animals in captivity in many publications, workshops, public talks, TV and radio (e.g.,
http://www.americanscientist.org/issues/feature/a-bigger-better-brain/1
http://voices.nationalgeographic.com/author/mbearzi/

https://www.youtube.com/watch?v=6CHhG2GMuxM
http://america.aljazeera.com/watch/shows/america-tonight/articles/2014/6/25/baltimorea-s-aquariumthelatestbattlegroundinthedolphindebate.html
https://www.youtube.com/watch?v=-nC4dCVChik&feature=youtu.be

A list of articles, talks, TV and radio interviews, etc. that includes the subjects of social complexity and intelligence in dolphins and captivity issues is also available here:
http://www.oceanconservation.org/about/presskit.htm

I have worked as editor of several newsletters on biology and conservation, and I currently serve as a reviewer for scientific books and several peer-reviewed scientific journals.

A detailed curriculum vitae with other qualifications that might be relative to this case is included in Appendix A.

List of Publications (2005 to present date)

The following list includes published books and peer-reviewed publications authored and co-authored from 2005 to date:

Fandel, A., M. Bearzi, and T. Cook. 2015. Effects of ocean recreational users on coastal bottlenose dolphins (*Tursiops truncatus*) in the Santa Monica Bay, California. Bulletin of the Southern California Academy of Sciences, 114(2): 63-75.

Cook, T., K. James, and M. Bearzi. 2015. Angler perception of California sea lions (*Zalophus californianus*) depredation and marine policy in Southern California. Marine Policy Journal 51:573-583.

Hwang, A., R.H. Defran, M. Bearzi, D. Maldini, C.A. Saylan, A.R. Lang, K.J. Dudzik, O.R. Guzòn-Zatarain, D.L. Kelly, and D.W. Weller. 2014. Coastal range and movements of common bottlenose dolphins (*Tursiops truncatus*) off California and Baja California, Mexico. Southern California Academy of Sciences Bulletin 113(1): 1-13.

Bearzi, M. 2012. Dolphin Confidential: Confessions of a Field Biologist. Chicago University Press.

Bearzi, M. 2012. Cetaceans and MPAs should go hand in hand: a case study in Santa Monica Bay, California. Ocean & Coastal Management 60: 56-59.

Bearzi, M. and C. Saylan. 2011. Cetacean ecology for Santa Monica Bay and nearby areas, California, in the context of the newly established MPAs. Southern California Academy of Sciences Bulletin 110(2): 35-51.

Bearzi, M. and C.B. Stanford. 2010. A Bigger, better brain. American Scientist 98: 2-9.

Bearzi, M. and K. Patonai. 2010. Occurrence of the barnacle (*Xenobalanus globicipitis*) on coastal and offshore common bottlenose dolphins (*Tursiops truncatus*) in Santa Monica Bay and adjacent areas, California. Southern California Academy of Sciences Bulletin 109(2): 15-22.

Bearzi, M., C. Saylan, and J. Feenstra. 2009. Seabird observations during cetacean surveys in Santa Monica Bay, California. Southern California Academy of Sciences Bulletin 108(2): 63-69.

Bearzi, M. 2009. Dolphins in the water off California. Pp. 116-117 In: Thoreau's Legacy: American Stories about Global Warming. R. Hayes, ed. Union of Concerned Scientists/Penguin Classics, Cambridge, MA.

Bearzi, M., C. Saylan, and A. Hwang 2009. Ecology and comparison of coastal and offshore bottlenose dolphins (*Tursiops truncatus*) in California". Journal of Marine and Freshwater Research 60(6): 584-593.

Bearzi, M., S. Rapaport, J. Chau, and C. Saylan. 2009. Skin lesions and physical deformities of coastal and offshore common bottlenose dolphins (*Tursiops truncatus*) in Santa Monica Bay and adjacent areas, California. Ambio 38(2): 66-71.

Bearzi, M. and C. Saylan. 2008. A hand-held, PDA based system for seabird data collection during cetacean surveys. Journal of Marine Animals and Their Ecology (1)1:9-11.

Bearzi, M., C. Saylan, and C. Barroso. 2008. Pinniped ecology in Santa Monica Bay, California. Acta Zoologica Sinica 54(1): 1-11.

Bearzi, M. and C.B. Stanford. 2008. Beautiful Minds: The parallel Lives of Great Apes and Dolphins. Harvard University Press. 351 pp.

Bearzi, M. and C.B. Stanford. 2007. Dolphins and African apes: comparisons of sympatric socio-ecology. Contributions of Zoology 76(4): 235-254.

Navarro, M.O. and M. Bearzi. 2007. Affect of Marine Mammals on Sport Fishery in the Santa Monica Bay, California. Southern California Academy of Science Bulletin 106(3): 215-217.

Bearzi, M. 2006. California sea lions use dolphins to locate food. Journal of Mammalogy 87(3): 606-617.

Bearzi, M. 2005. Habitat partitioning by three species of dolphins in Santa Monica Bay, CA. Southern California Academy of Science Bulletin 104(3): 113-124.

II. CASE REVIEW

1. Background

This background summary on killer whales includes and highlights information useful in better understanding my remarks relative to the provided MSQ files and my observations during the inspection of the killer whale named Lolita and the facility where she is kept, the Miami Seaquarium in Miami, Florida, on January 20, 2016. It is not intended, by any means, to be comprehensive and I refer to a list of citations at the end of this report for more detailed information.

The killer whale (*Orcinus orca*) is a striking recognizable odontocete cetacean and one of the most widely distributed marine mammals in the world (Ford 2002). Many people consider killer whales, also called orcas, whales. They are actually member of the family *Delphinidae*: what we commonly call dolphins. This species can be found in all oceans and most seas, but it is usually recorded in colder regions and coastal waters, especially where productivity is high (Ford 2002). A high number of killer whales occur in the waters along the North-western coast of North America, around Iceland, and along the coasts of Norway (Ford 2002).

The maximum body length measured for this species is about 9 m (29.53 ft) in males and 7.7 m (25.26 ft) in females. The maximum measured weight is 5568 kg (12,275 lb) for a 6.75 m (21.98 ft) male and 3810kg (8,400 lb) for a 6.7m (22.15 ft) female (Dahlheim and Heyning 1999). Killer whales show sexual dimorphism in size, with males developing larger appendages than females, such as pectoral fins, flukes and dorsal fins that in males can reach the height of 1.8 m (5.9 ft; Ford 2002).

Past research has identified different populations of killer whales worldwide. Long-term studies conducted in the wild using photo-identification of individuals from natural markings have contributed to the knowledge of some of these animals' populations (Bigg et al. 1990, Ford 2000, 2002). Best known are the killer whale populations in the eastern North Pacific Ocean, which include three distinct ecotypes: resident, transient or Bigg's, and offshore. These ecotypes differ in certain ways related to distribution patterns, morphology, ecology, behavior and genetics (Hoelzel et al. 1998, Barrett-Lennard 2000). They share at least some of their home range (sympatry), but they don't intermix with one another (Bigg et al. 1990, Ford 2000, 2002).

Resident killer whales are mostly fish-eaters while transients typically feed on marine mammals (Ford 2002, Ford and Ellis 2006). Resident killer whales studied around British Columbia, Washington and Alaska since 1970 occur in large social groups called "pods". These are groups of related matrilines[1]

[1] A matriline is a highly stable group made of a female, her sons and daughters and the offspring of her daughters. Individuals in a matriline don't usually separate for more than a few hours. A matriline ranges from 1 to 17 individuals

(the core social units) that share a common maternal ancestor; individuals in a pod are usually associated over 50% of the time (Bigg et al. 1990). Pods with similar vocal dialects and thought to be related are called clans. Above the clans, and at the top level of social structure, there are the communities made up of pods and not based on maternal links or similar dialects but sharing the same range and associating with another (Ford 2002). In the US North Pacific, residents are separated in four different populations: Southern, Northern, Southern Alaskan, and Western Alaskan. The Southern residents include about 80 individuals in 3 pods and 1 clan; group size ranges in size from 2 to 50 individuals (Dahlheim and Heyning 1999, Ford and Ellis 1999).

Southern resident killer whales consist of three pods: J, K and L pods (Lolita belongs to the L pod). These pods reside for part of the year in the inland waterways of Washington State and British Columbia (Strait of Georgia, Strait of Juan de Fuca, and Puget Sound), mostly during the late spring, summer, and fall (Bigg 1982, Ford et al. 2000, Krahn et al. 2002, Pearson et al. 2009). Pods have visited coastal sites off Washington and Vancouver Island (Ford et al. 2000), and are known to travel as far south as California and as far north as the Queen Charlotte Islands (NOAA 2014). These whales are considered one "stock" under the MMPA (Marine Mammal Protection Act) and one "distinct population segment" - therefore "species"[2] - under ESA (Endangered Species Act). The Southern resident population was listed as endangered under the ESA in 2005. Resident killer whales' life history and population dynamics in the coastal waters of British Columbia and Washington State is well known and more detailed information can be found in Bigg et al. (1987, 1990), Oliesiuk et al. (1990), Ford et al. (2000). Since the early 1970s, this population has also been photographically censused year-round (Bigg 1982, Bigg et al. 1987), offering insights into this matrifocal society (Pearson et al. 2009).

The last two decades have seen the proliferation of anatomical and morphological investigations on cetaceans. We now recognize that killer whales and other cetaceans are large-brained animals living in complex societies (for a review of cetacean societies and their intelligence see: Baird 2000, Mann et al. 2000, Bearzi and Stanford 2008, 2010). Neuroanatomical studies of dolphin brains have shown that these animals possess an intricate and developed neocortex as compared to other species, including humans, and a distinctive folding of the cerebral cortex, which in cetaceans is even more prominent than in primates (Marino et al. 2007). This is important to consider because these structures are both associated with complex information processing. Dolphins also have spindle-shaped neurons, or *Von Economo* neurons, which are key for social cognition and have been linked in humans to an ability to "sense" what others are thinking (Marino et al. 2007). Dolphins, like humans, have limbic and paralimbic regions and are able to experience a broad spectrum of emotions (for a review see: White 2007, Bearzi 2012). This brainpower has allowed dolphins such as

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spanning on an average of three generations (range=1-5; Bigg et al. 1990, Baird 2000). Matriarchal females appear to guide the behavior of individual matrilines (Boran and Heimlich 1999).

[2] http://www.fisheries.noaa.gov/pr/species/esa/

killer whales to develop complex communication and social skills. Only in a few species like dolphins, great apes, and humans, do we find brain complexity, social complexity, and ecological complexity so closely linked (Bearzi and Stanford 2008).

Killer whales spend most of their time foraging, traveling, resting and socializing, with foraging and traveling being the most predominant activities. Residents spend about 60-70% of their time foraging and traveling and the rest of the time socializing and resting (Ford 2002). Their traveling speed is about 10 km/hr (range = 4-20 km/hr) but they can reach speeds of about 40 km/hr (Ford 1989, Williams et al. 2002). Resident killer whales usually travel in "deliberate, forward-moving patterns, with 2-3 short dives, 10-12 seconds apart, followed by a 'sounding', a dive that lasts in average 2-3 minutes" (Baird et al. 2005, Kirby 2012). These animals' dive depth during foraging activities can reach up to 300 m (980 ft) but they spend most of the time (>70%) doing dives in the upper 30m (98 ft; Baird 2000). Southern Residents spend more time traveling than their Northern counterparts (Heimlich-Boran 1988); this is likely due to longer distances covered between their feeding sites (Ford et al. 2000). While resting, resident orca pods stay tightly together, often in a line abreast formation with synchronized dives of 2-5 minutes separated by shorter dives (Ford 1989).

Social behavior includes a wide range of activities and interactions among individuals (e.g., spyhops, breaches, tail lobs, head stands, fin slaps, etc.) and youngsters often include objects such as kelp or jellyfish in their play activities (Ford 2012). Southern Residents perform more aerial displays than northern residents and engage in a greeting ceremony that occurs when pods meet after being separated for a day or more (Ford et al. 2000). Aggressive interactions between killer whales have rarely been observed (NMFS 2008).

Killer whales are top ocean predators and each ecotype exhibits different hunting techniques. These foraging techniques and specialization are passed across generations and are not found in other mammals (Baird 2000, Ford 2002). Cooperative hunting, food sharing, and innovative learning are other well-known foraging traits in killer whales (Boran and Heimlich 1999, Baird 2000, Ford and Ellis 2006). Resident killer whales have strong seasonal movements associated with coastal migration of their favorite prey, salmon (Ford 2002). These whales eat a variety of fish, but mostly salmonid prey (fat-rich Chinook is their favorite fish; Ford and Ellis 1999, 2006). Salmon-hunting whales can disperse over wide areas, with individuals moving at similar speed (6 km/hr) and in the same direction. Foraging by these whales lasts about 2-3 hours but can extend up to 7 hours and frequently involves sharing of prey by two or more whales (Ford 2002)[3]. Killer whales use a combination of echolocation and passive listening to detect their prey (Barrett-Lennard et al. 1996); vision and echolocation are likely used during prey capture. These animals cooperate adopting different techniques to herd schools of fish together (Van Opzeeland et al. 2005) and orcas generally

[3] "Prey fragments left at kill sites resulted mostly from handling and breaking up of prey for sharing, and all species and sizes of salmonids were shared" (Ford and Ellis 2006).

"like to process their food; they don't chew and they tend to tear and swallow chunks of flesh whole." (Kirby 2012).

Vocal communication is highly advanced in killer whales and represents an essential element of this species' complex social structure. Killer whales produce a variety of sounds such as clicks, pulsed calls, and whistles for both echolocation and social interactions (Ford 1989). Resident killer whales have vocal variation that changes based on their behavior and group identity. During foraging activities, individuals display stereotyped and repetitive discrete calls. Social activities involve mostly non-repetitive pulsed calls and whistles; excitement can result in variation in pitch and durations of "discrete calls" (Ford 1989, 2002). The same call repertoires are shared by all pod members (group-specific dialects), and some parts of them can also be shared with other pods.

As recorded in many other cetacean species, social bonds are extremely important in a killer whale's existence. Residents are well known for their long-term associations and one of the strongest bonds is that between a mother and her calf, which stay together for life (Baird 2000, Rendell and Whitehead 2001). A mother teaches to her calf how to survive in the ocean and young individuals of resident killer whales learn dialects by mimicking mothers and siblings. These dialects stay in a matriline and appear to have the function of helping group identity and cohesion, as well as the avoidance of inbreeding (Barrett-Lennard 2000, Ford 2002).

Only a few groups of animals on Earth exhibit cultural traits (Whitehead and Rendell 2015). Cetaceans exhibit elements of culture. A good example of culture and social learning in dolphins is the vertical cultural transmission of foraging and feeding specializations and vocal dialects in killer whales.

Killer whales play, bond, communicate, imitate, learn from each other and transfer information from generation to generation. This ability to transfer learned behaviors to their progeny makes them cultural animals like us. And like us, they can recognize themselves as individuals and are self-aware, even if the extent of dolphin self-awareness requires further exploration (Marino et al. 2007, Bearzi and Stanford, 2008, 2010).

Lolita

Lolita is a member of the L25 subpod[4], which currently includes the matriarch L25 (her probable mother which is still alive), two reproductive females with calves, and a mature reproductive male. Lolita was removed from the L Pod – the largest of the three southern resident pods - in 1970 during a controversial live-capture operation in Penn Cove in which several other orcas died in the process. This and other capture operations are responsible for the removal of one third of the

[4] A subpod is defined as a group of matrilines that spends more than 95 percent of their time together (Baird 2000).

Southern Resident population by the time live-captures ended in Washington State in 1976. This take, along with other factors, led to ESA protection for this DPS (Distinct Population Segment) back in 2005. Lolita is the only surviving individual from these removals; she is now 51 years old and has spent 45 years at the Miami Seaquarium entertainment park. A male killer whale named Hugo was her companion until his death in 1980, but Lolita and Hugo never produced offspring. Since 1980, Lolita has been without the company of any other member of her species. She has only been allowed to associate with other species of dolphins such as the two Pacific white-sided dolphins that currently occupy the same tank.

Further, since the death of her tank companion Hugo, Lolita has not been able to breed and she is likely no longer able to have estrous cycles. Lolita has been deprived of contributing genetically to her pod. In the wild, however, "matrifocal societies confer particular significance to older females" (Parsons et al. 2009), and older females can still play different roles, including alloparenting[5] and other care-giving roles (adoptions by post-reproductive females in resident killer whales have been observed). Females of southern resident killer whales in the wild are known to live up to 90 years old while males are estimated to reach 60-70 years of age. This life expectancy surpasses what has been observed in captivity where the majority of these animals die before their early 20s (for a review: Rose 2011). Although captive orcas survival has risen over the years, these animals still lag behind their wild counterparts considerably (Small and DeMaster 1995, Jett and Ventre 2015). Lolita is an exception having already long outlived the majority of killer whales in captivity. As discussed below, however, continuing to keep her at the Miami enclosure will likely reduce her likelihood of realizing her potential lifespan in the wild. Her gradual reintroduction into her native habitat and the reunion with her family members can contribute greatly not only to Lolita's wellbeing but also that of other members of her species.

[5] Older female orcas care for the juvenile offspring of other females for short periods to allow the mothers to focus on foraging or other activities.

2. Inspection at Seaquarium

I was present for the inspection of the Miami Seaquarium killer whale facility from 7:00 a.m. to 1:15 p.m. on January 20, 2016. I recorded detailed information on the behavior of Lolita, including her interactions with the two Pacific white-sided dolphins (PWSDs), and her surrounding environment. During the various sessions (husbandry, play, training and show), I recorded notes on Lolita's activities and interactions with her trainers and other Seaquarium staff members. Data were collected at 5-minute intervals from 7:10 am to 1:10 pm.

Behavior

As I entered the killer whale facility, Lolita was motionless at the bottom of the main tank (area A) near the wall (see Exhibit A for approximate location), while the PWSDs were floating at the opposite side of the tank behind the center island (area B). After our staff was seated in the stadium, as I was beginning my observations Lolita approached the glass in our direction and, after a brief initial inspection and a glance, slowly returned to the same spot where she came from, facing the tank wall. From this moment on and for the entirety of the undisturbed observation period (including before, in between and after sessions), Lolita moved slightly and rarely from this location of the tank. Exhibit A (see red line) shows the approximate range of movement of Lolita during most of the undisturbed observations; this range of movement was slightly longer than her body length.

I was able to record a consistent pattern in her behavior during my observation: Lolita alternated between spending extended amounts of time motionless at the bottom of the tank (see also inspection video 6 Camera A, clip 22:15-23:57, inspection video 7 Camera A clip 24:57-25:45, inspection video 9 Camera A, clip 15:32-18:07, etc.), always facing the wall (with an average time at depth of 2.4 minutes; n=39, range=30sec-8min), and surfacing in approximately the same spot. At the surface, she was mostly logging (floating motionless) or displaying a slow, stereotypical side body/head movement, with an occasional chin up (see also inspection video 6 Camera A, clip 24:00-24:40, inspection video 7 Camera A, clip 7:36-8:55, 25:45-26-42, inspection video 8 Camera A, clip 10:15-11:03, etc.). Lying motionless at the bottom of the tank for extended time, logging and displaying side-to-side movements are abnormal and repetitive behaviors that appear to have no obvious goal or function. During this time, Lolita kept her eyes mostly underwater, perhaps to help her in scanning for the presence of PWSDs considering the harassing behavior observed from the PWSDs and confirmed in the Animal Behavior Records which show a high number of rakes regularly present on different areas of her body, especially her belly area (see my remarks on *Animal Behavior Records* section). These observations are contrary to the content of the Relationship Talk given to the public by Seaquarium staff which wrongly portrays these animals as a "big family" (see Animal Training Manual, Relationship Talk, Track 9, MSQ0009834). PWSDs were recorded inspecting or swimming above Lolita when she was at depth on eight occasions during the observation time (e.g., video 7 Camera A, clip 00:00-1:30). PWSDs harassed Lolita twice and were

displaced/chased away in at least four separate instances (see also inspection video 5 Camera A: Lolita logging until 22:49, at tank's bottom until 24:05, displacing/chasing PWSDs at 24:05, back to bottom at 24:50). In one instance of harassment, upset vocals by Lolita were perceived at our observation location. Based on the observations and my experience with these animals in the wild, the interactions appear to disturb, or mostly annoy, Lolita. This conclusion is supported by information included in the Animal Behavior Records and the number of rakes continuously reported on Lolita's body (see my remarks on *Animal Behavior Records*). In the wild, Lolita would have been among the members of her own species, and free-ranging killer whales have the option of avoiding mixed-species interactions if unwanted (pers. observations, Black 1994, Ford 2002). In her tank, Lolita is not only deprived from living with her own family members but she has no way of escaping the regular harassment by PWSDs, which are not a biologically related[6] species.

During the undisturbed observation period, and excluding the interaction with PWSDs explained above, the two different species mostly remained at opposite sides of the tank, with the PWSDs located in the farther corner of area B and Lolita in her spot of area A.

It's important to note that Lolita survives in a small concrete tank filled with chlorinated water lacking any kind of environmental enrichment. There is no substrate or any other type of natural enhancement (see Seaquarium Document Review - *Lack of Stimuli & Boredom* section). One possible reason why Lolita didn't move from the same spot shown in Exhibit A could be attributed to the presence of what it seems is an outflow valve on the bottom of the tank (see red circle in Exhibit A for approximate location, and video 6 Camera A, clip 22:15-23:57 for Lolita's position). She often seemed to face this outflow direction as if its presence was a source of interest for her. Perhaps, this was a way for Lolita to be "entertained" in total absence of stimuli and with nowhere to go. Further, Lolita was up-close and motionless to a valve likely introducing concentrations of highly chlorinated water, which is probably not ideal for the health of her eyes (already treated with medications) and other parts of her body (see Seaquarium Document Review - *Health Issues* section for details).

For the entire undisturbed observation period, prior or following the trainer sessions, Lolita never moved much past us and never went to the area B which seemed to be where the PWSDs spent most of their time floating, swimming or interacting with each other. She never displayed, except for the interactions with the PWSDs described above, any other particular behavior that resemble the life of wild killer whales. The only exceptions to her stereotypical, and at times almost "catatonic" behavior explained above, were: a) a few instances in which she slowly moved in our direction along the poolside, b) when she inspected/scanned a small portion of the tank (perhaps for the presence of PWSDs), c) when she was being harassed by the PWSDs or d) when she was displacing them/chasing them away. Based on these observations and my experience with killer whales in the wild, the behavior displayed by Lolita in captivity during the undisturbed observation period likely

[6] "Biologically related" means that species are connected by a direct genetic relationship.

represents both annoyance and boredom and is certainly not indicative of a thriving animal or, for that matter, one kept in good care.

In addition to the undisturbed observations, I was able to observe Lolita during husbandry, play and show sessions. During the 25-minute play session, Lolita was exposed to two types of "toys", a hose and two wetsuits. These are the two main toys used by her trainers to entertain and stimulate Lolita (see also Animal Behavior Records). In the Animal Behavior Records, the use of these toys, especially "wetsuits", is reported on a weekly basis throughout the years. In 2015, she was exposed almost exclusively to these two toys (see specific comments for 2015 in *Animal Behavior Records* section), showing that Lolita, a highly social and complex animal in her own environment, is deprived of stimulus diversity.

I am not aware of the reasoning behind consistently using a "wetsuit" as a toy for Lolita, but I found it a poor and potentially dangerous choice on several levels. A wetsuit is what trainers wear during sessions when interacting with the animal so the message for the animal to "play" with something that a trainer wears, seems foolhardy. I also observed the trainer play "tug-of-war" with the wetsuit in the mouth of Lolita. The trainer let Lolita bite the wetsuit and then repetitively pulled on the opposite side while leaning toward the animal (this happened while the spotter wasn't watching; see also inspection video 14 Camera A, clip 4:00-5:15). In addition to the potential danger to trainers that this "game" can cause, such interactions highlight irresponsible actions taken by trainers that risk exacerbating already abnormal and potentially aggressive behaviors by Lolita. This is especially worrisome in light of the many accidents and the deaths of several trainers by killer whales reported in captivity and now well-known to the media (e.g., Rose 2011, Hargrove 2015). In the wild, there are no records of killer whales killing humans and few reports of serious injuries inflicted by wild killer whales on people. On the contrary, four people have already been killed by captive orcas and there are dozens of reported incidents of injuries inflicted on humans by orcas in captivity (Rose 2011). Once again, this practice may send the wrong type of message to an intelligent top predator such as Lolita living a stressful existence in an abnormal environment (see also my comments in Seaquarium Document Review).

With the exception of the tug-of-war that seemed to get Lolita's attention, and a few interactions with the hose, her energy during this session was generally low. Overall, Lolita did not respond with enthusiasm to the play session, in accordance to the behavioral quality score reported in the Animal Behavior Records (see specific comments). This information reinforces the general boredom displayed by Lolita that – based on my experience - is contrary to how this species behaves and thrives in its own natural environment.

During the show, I observed the tricks (described by the Seaquarium staff as "behaviors") displayed by Lolita, her interactions with the trainers and the audience. Most of the conditioned behaviors recorded during this session were not remotely reminiscent of how these animals live or behave in

their own environment (e.g., moving around the edge of the tank showing the flipper to salute the audience – see also inspection video 17 Camera A, clip 26:22-26:38; jumping on the platform to show her body out of the water raising the tail and "presenting" the mouth – see also video 17 Camera A, clip 31:11-31-24) The "Relationship Talk" during the show (see Animal Training Manual, Relationship Talk, Track 9, MSQ0009834) states, "*Over the last 45 years, Lolita formed very special relationships not only with her dolphin companions, but also with her trainers (pause briefly for relationship)*…" First, this is a misinterpretation of the true relationship between the PWSDs and Lolita observed during the undisturbed observation period and reported in the Animal Behavior Records. Second, some of the behaviors displayed by Lolita often involved kissing and other human form of affections, likely to stress the strong social bond between trainer and Lolita for the public. This sends a false message to the audience, considering that human displays of affections are meaningless within the context of the complex social behavior shown by this species in the wild. Displays of affection and bonding with the trainers are reinforced through consistent food rewards.

The show seemed to be pure entertainment for the audience with little or no educational value. The conditioned behaviors displayed by Lolita that I observed during the show were not an educational experience by any means as they have little to do with killer whale behavior in the wild. Jumping and repetitively splashing the audience on command or snatching a fish from the hand of a trainer during the performance are just stereotyped behaviors that show little, if anything of these animals' everyday life. This raises questions not only about her psychological and physical well being but also puts the argument for the educational value of keeping her confined in question.

In conclusion, how Lolita behaved prior, during and after the sessions has, in my twenty-plus years of experience with these animals, little in common with how wild killer whales live. Lolita is not only confined in a small space with species that are not her own, but she is deprived from living in her natural pod expressing all aspects of her social and ecological complexity. She has not associated with conspecifics in over 35 years. For any field cetologist such as myself knowing anything about how these animals live in their own environment this is possibly one of the cruelest aspects of her captivity status. As mentioned in the background summary, killer whales are large brained animals, living in stable social groups with strong bonds that, in many ways, resemble our own species (Baird and Whitehead 2000, Ford et al. 2000, Mann et al. 2000, Rendell and Whitehead 2001, Perrin et al. 2002, De Waal and Tyack 2003, Bearzi and Stanford 2008). Residents spend their time together foraging and sharing resources, traveling, communicating and socializing. It is fundamentally harmful to hold them in solitary confinement without conspecifics. Keeping Lolita with other not compatible species of cetaceans (the two PWSDs) is nonsensical considering the ecological and social needs of this individual, and especially considering Lolita's ESA-listing. The psychological damage of Lolita's sensory and physical isolation and deprivation of social bonding is probably somehow already permanent in her and some of the stereotypical behaviors observed during the inspection are an indication of such confinement. Nevertheless, I believe that Lolita would highly benefit from being released to a more appropriate environment such a sea pen in her native waters

and, later on, perhaps even a full release in the open ocean. Retiring Lolita to a sea pen, taking all the necessary precautions and steps to ensure safe transportation and rehabilitation, will allow this animal not only to experience, once again, a life at sea, but may also allow her to reconnect with the members of her family, some of which are still alive. Based on the findings of this report, leaving Lolita in her current environment in her present captive status is likely to lead to even more harm to the animal.

It's worth mentioning that the prolonged relative social isolation in captivity of the male killer whale called Tilikum, often due to repeated attacks by two dominant female orcas, lead him to pathological behaviors that unfortunately include the killing of trainers.

Tank Dimensions

During the inspection, I compared the dimension of Lolita's tank to her body size as her mobility is directly tied to her psychological and physical needs. Lolita's tank measures 80 ft x 60 ft with a depth ranging from 12 ft to 20 ft. The longest distance from the center island (or platform) to the wall directly opposite, however, it measures only 35 ft (despite the fact that the Animal Welfare Act mandates a minimum horizontal dimension of 48 ft for a killer whale enclosure). These dimensions reduce Lolita's ability to move freely in the entire tank area (A+B). The center island functions as an obstruction for the already confined space in which Lolita is forced to survive. Lolita cannot access the back area (B) unless the gates are open. Considering that Lolita can't dive under the platform or leap over it when the gates are closed, means the effective width of the tank is reduced to 35 ft, not 60 ft. Lolita is approximately 20 ft long so the width of this tank is only 15 ft. longer than her full length. Further, the tank, when full (see comments about "water drops" in Animal Behavior Records) has a maximum depth of 20 ft that corresponds to the entire length of Lolita's body. A few times during the observation period, Lolita appeared to drag her flukes on the bottom of the tank which slowed and impaired her natural range of movement. I also observed her making "adjustments" to avoid touching either the walls of the tank or the platform. She was not freely able to breach because of inadequate tank depth. Clearly, the depth of this tank doesn't allow Lolita to dive sufficiently deep to propel her entire body out of the water, a behavior that is known in the wild. Lolita is not able to swim more than 60 ft in a straight line, which means she is not able to engage in normal swimming behavior.

Another obvious feature of Lolita noted during my inspection was her collapsed dorsal fin. Collapsed dorsal fins are very common in captive killer whales and are thought to most likely originate from an irreversible structural change in the fin's collagen over time (NMFS 2008). The reason for this physical abnormality is likely related to captivity-induced stress (lack of movement, large amounts of time spent logging on the surface, circling the tank, etc.; NMFS 2008). In contrast,

only about one percent of wild orcas exhibit the collapse of the dorsal fin[7] (Rose 2009, Jett and Ventre 2012).

In the wild, resident killer whales occupy wide ranges and often travel in straight lines, swimming up to 160 km (100 miles) in one twenty-four hour period (Baird 2000). As previously explained, their traveling speed is about 5-10 km/h but they can reach speeds well over 30 km/hr (Ford 1989, Williams et al. 2002). Although residents spend large amount of time in the upper 30 m (98 feet), they are known to dive over 300 meters (980 feet) and they spend 95 percent of their time underwater (Baird 2000). There is no way that any killer whale kept in a tank can even closely exhibit the range of movement of their wild counterparts, but due to her undersized tank, Lolita is even more restricted from swimming and diving normally than other captive killer whales. The above comments illustrate how Lolita's psychological and physical health is poor not only compared to her native resident population, but also to other dolphins kept in captivity.

Lack of Sun Protection

Another issue that raised my concern during the inspection was the total lack of protection from the sun for Lolita's enclosure. For wild cetaceans it is well known that species spending more time at the water's surface are more prone to sun damage, as manifested by epidermal lesions consistent with sunburns (Martinez-Levasseur et al. 2010). In the course of my studies off California, I personally witnessed skin damage on whales spending more time at the surface. Killer whales in their natural environment spend only 5 percent of their time on the surface (Ford 2002), consequently avoiding sun exposure. Lolita, however, not only has no escape from sun radiation due to the absolute lack of shade and shallow tank depth, but her sustained logging at the surface of the tank contributes to her exposure to potential sunburn, as also reported for other killer whales in captivity (Jeff and Ventre 2012). Blisters, wrinkles and sunburns on Lolita's skin have been recorded both in the Animal Behavior Records and by a former caretaker. In addition to skin lesions, UVR exposure can suppress immunity to pathogens, subjecting Lolita to other potential issues such as mosquito-transmitted viruses (Jett and Ventre 2012).

In addition to the lack of sun protection, Lolita has no shelter from hurricanes at the Seaquarium facility. Miami is known to be an area in the United States that is prone to hurricanes, and these huge storms have been recorded in the Animal Behavior Records.

Anthropogenic Noise

Throughout the entire observation period, there was persistent and loud anthropogenic noise caused by construction, pumps, airplanes, people passing by, audience and music during shows, trucks and

[7] In captivity, almost all captive adult males have fully collapsed dorsal fins and a large number of adult females have partially or fully collapsed dorsal fin (Rose 2009).

cars[8] or a combination of the above. I visually observed and heard at least one airplane going by over Lolita's tank in each of my 5-min observation period. Considering that most, if not all of these noise sources appear to be ongoing daily at the facility, Lolita appears to be subjected to noise exposure on a recurring basis. Killer whales hear sounds at frequencies up to 120 kHz[9], with the greatest sensitivity ranging around 20kHz (Szymanski et al. 1999). In comparison, the range of hearing of a healthy human is 0.015–20 kHz.

Anthropogenic noise affects various aspects of cetacean biology (Luksenburg and Parsons 2009). The impact of anthropogenic noise on cetaceans has attracted considerable attention as noise can cause, among other issues and if strong enough, hearing impairment, changes in behavior (e.g., increase time at depth), even stress (Richardson and Würsig 1997, Luksenburg and Parsons 2009). Airplanes, for instance, produce noise at frequencies that are well within the frequency range of cetacean calls (Richardson and Würsig 1997) and the sound pressure levels could have profound effects on cetaceans located along busy flight trajectories (Luksenburg and Parsons 2009). In captivity it is possible that hearing loss could be caused by animal husbandry factors (use of certain antibiotics) and tank noise (Szymanski et al. 1999).

Lolita has been exposed to these sources of noise for the last 45 years. Further, Dr. Whitehead's paper (1990) on captive cetaceans compared the experience of a "highly acoustic cetacean...[such as an orca] living in a tank with acoustically reflective walls, to that of a visually oriented animal, like a human, living captive in a room covered with mirrors on all walls and the floor. The experience is likely to be profoundly disturbing, especially over the long term." In Lolita's case this can be considered as harassment, especially in view of the shallow depth of her tank that offers no escape from acoustic disturbance (see *Barren Tank*). Seaquarium has continually emphasized that Lolita is a "*creature of habit*" and must be kept in a stable environment. They have stated that anything outside of her "normal" daily routine can produce stress. However, prevalent noise from sources such as construction and maintenance as mentioned in the MSQ document review is not consistent with maintaining a quiet and stress-free environment for this animal.

Barren Tank

Lolita survives in a noisy undersized, concrete tank in which, as previously noted, there is no substrate or any other type of natural enrichment (see Seaquarium Document Review - *Lack of Stimuli & Boredom* section).

Killer whales rely highly on sound. Ford (1989) describes three distinct types of vocalizations used by killer whales: whistles, calls and clicks. Whistles are high frequency sounds usually used by killer

[8] Trucks and cars passing by are visible behind the Miami Seaqaurium sign throughout the Inspection videos (camera A).
[9] For frequency range of killer whales check: http://www.wsdot.wa.gov/NR/rdonlyres/AE439D96-BD72-4D1E-BB99-0C8E228E0F13/0/BA_MarineNoiseFrequ.pdf

whales in social contexts over relatively short distances. Calls are pulsed signals and they are long-range communicative sounds able to travel over tens of miles (Durban and Deecke 2011). Pulsed calls are likely to have a key role in the coordination of behaviors and maintenance of group cohesion (Ford 1989). Pulsed calls have discrete patterns that can be recognized by ear and by spectrogram. These highly stereotyped calls are the main component of the orca communication repertoire and each pod has its own set of calls named "dialects". Larger acoustic groups (called "clans") are formed by pods sharing common calls. A degree of variability is known within call types, even for different maternal groups within pods and clans. The differences in vocal call types between clans does not seem to stop the various maternal groups and pods within a community from coming together and socializing (Ford 1989, Barrett-Lennard et al. 1996). Another important aspect of the structure of these call types is that they evolve slowly over time and they are learned from generation to generation. Finally, clicks are short-duration, broadband signals that are used for echolocation. Killer whales use echolocation to navigate and to hunt; this is for them an accurate way of "seeing" underwater. Their hearing is so sensitive that they can tell the difference between fish species.

In wild killer whales, the use of sound lies at the core of these animals' life and it's essential in keeping balance in their communities. I have witnessed how these animals in the wild rely on sound to communicate with each other and navigate in their environment. I have listened to their underwater "conversations" from my research boat using hydrophones in tow. Family members are usually in hearing range of one another and communication is a key ingredient in keeping individuals together during their traveling (Baird 2000, Ford 2002). In her tank, Lolita is deprived of all sensory experience. Her limited concrete environment is completely monotonous. There is no reason to echolocate because there are no fish to hunt for; there is no place to explore using sound; there are no conspecifics to communicate with. There are only acoustically reflective, smooth walls (Whitehead 1990) not able to deflect, absorb or disperse sound in a natural manner (WDCS 2001). This doesn't mean that Lolita can't vocalize but the reasons for using sound and the frequency of her vocalizations are completely skewed, different and reduced from those of her natural environment.

3. Seaquarium Document Review

In addition to my professional expertise as a field cetologist and behavioral ecologist, I relied upon the documents provided by the Seaquarium to form my opinions. I was able to make a preliminary analysis in the brief time period provided by the court for review of these documents, and despite the absence of some important records not provided by Seaquarium in time for this review. Obviously, more time and complete records would result in a more comprehensive analysis, however I am confident that the following comments, based on my preliminary analysis, emphasize how this animal is far from "thriving" in her captive status and illustrate the need for her release from this facility.

ANIMAL BEHAVIOR RECORDS

The Animal Behavior Records provided by Seaquarium were incomplete (the entire 2005, 2007 and 2008 years were missing from the 2001-2015 dataset). The records that I reviewed covered only "day highlights" of Lolita's activities and her health status reported by various trainers when in situ. These records lack time references and the reporting appears subjective and often incomplete in nature.

The following are my comments on data that I was able to extract from the reviewed documents.

Tank Gates

Records for the reviewed years mention the regular gating of one side of the tank with the separation of area A from area B. Closing the gates appeared to be related to cleaning routines (with divers in water), tank issues (painting, etc.) and medical exams. Gating, however, was also used to separate the two species for other reasons. Review of records shows that this separation of the two species (overnight or otherwise) was also likely related to: a) Lolita's health issues (administration of medications, presence of rakes/scrapes/rubs, etc. on her body), b) precursors of aggressive behavior displayed by Lolita toward the PWSDs (likely as a result of rakes on her body), or c) a combination of the two. As a result, there are many records reporting the overnight or all day reclusion of Lolita in one of the two tank areas (usually area A, but sometimes area B, e.g., 11-12-2013 MSQ3476, 4-21-2009 MSQ9581). In the year 2015 alone, Lolita was gated overnight for almost a month. There are many examples of Lolita's reclusion in one side of the tank due to the above-mentioned reasons. A few are reported here below, focusing attention on most recent times:

- 5-11-2015 MSQ3706: large scrape observed on Lolita's pectoral fin; she displays pattern swimming throughout the day; she is given tramadol medication. Lolita gated overnight in A;
- 1-7-2015 MSQ3742: new rakes by lags on her ventral side and dorsal fin. Lolita gated overnight in A;
- 7-1-2015 MSQ3694: Lolita tense at lags. Gated in A;

- 5-5-2015 MSQ3708 Lolita tense (and new lag rakes on belly recorded). Gated in A;
- 1-9-2015 MSQ3742: Lolita broke control, displaced by lags. Separated in A;
- 7-10-2014 MSQ3616: turned head, head bob. Gated in A all day;
- 7-5-2014 MSQ 3619: off position, sank, vocalize toward lags, under. Gated in A (also gated the day before all day);
- 3-17-2006 MSQ9426: Lolita broke control responding well below acceptable criteria. Gated in A. She was also separated several times from 3-13-06 to 3-18-06 and gated overnight in A on 3-15-2006.

Seclusion of Lolita in one of the two areas was also related to "water dropping" or "water drops" in the tank. I am assuming herein that the "water dropping" mentioned in the Animal Behavior Records means a reduction in water level in the pool. For example, water dropping was reported at least in 10 different days in 2015 and 13 days in 2002. In 2001 the water dropped from 1/4 to 1/2 of the tank for four consecutive days. In 2002, it dropped up to 3 ft for three consecutive days in November and again up to 4 ft for six consecutive days in December. In 2014, it dropped for three days in a row but the extent of the drop was not recorded. During these and other water drops, Lolita was often gated in A overnight for days at a time. On the noted dates, water dropped 7 ft and 9 ft (11-21-2002 MSQ9046; 11-22-2002 MSQ9047).

Here are some examples of dates when Lolita was gated overnight due to water dropping up to 5 feet[10]:

- 9-28-2015 MSQ3746: water dropped 3 feet;
- 3-2-2015 MSQ3726: water dropped not specified;
- 6-9-2015 MSQ3698: water dropped not specified;
- 10-13-2015, 10-14-15 MSQ1642: water dropped 2 feet; only 8 shows;
- 12-22-2014 to 12-24-2014, MSQ3568: water dropped for 3 days; gated overnight for 3 days;
- 12-15-2014 to 12-16-2104 MSQ3570: water dropped two feet;
- 4-3-2014 MSQ3644: water dropped;
- 9-11-2012 MSQ3392: water dropped;
- 12-23-2010 MSQ9554: water dropped 2 feet;
- 3-20-2009 MSQ9529: water dropped 2 feet all day;
- 4-15-2009 MSQ9520: water dropped 5 feet during day and overnight;
- 1-5-2006 MSQ9446: water dropped 2 feet for two days in a row;
- 10-31-2003 MSQ9223: water dropped 3 feet; Lolita and PWSDs gated in A for 2 ½ days;
- 12-15-2003 MSQ9236: water dropped up to 4 feet;
- 12-16-2002 to 12-19-2002 MSQ9038: water dropped 3 feet;

[10] In the reviewed records it is not always reported how much the water dropped in the tank.

- 11-25-2002 to 11-27-2002 MSQ9044: water dropped up to 4 feet.

From the records, it also appears that Lolita is not only harassed by the PWSDs, which cause rakes on her body (see my comments in *Behavior* and *Health Issues*), but she is forced to spend a large amount of time, including overnights, in an area that is even smaller than her already undersized tank. Further, the water dropping reported in the records forced her to spend additional time in a tank with a depth that at one point reached only 11 feet. This lack of space and depth in the tank contributes even further to Lolita's already impaired ability to move freely explained in the *Inspection* section. Confining Lolita to a section of the tank, and/or allowing the water level of the tank to drop for sometimes days at the time, is not only stressful for the animal, but is contrary to the Seaquarium statements on the welfare of Lolita. For instance, Seaquarium states that "*adequate water, room and space are regularly provided to Lolita*" (MSQ10539, p.1) and that the PWSDs and Lolita are "*compatible*" and get along fine as a "*big family*". Based on my observations of this animal in captivity and my experience observing killer whales in the wild, neither one of the Seaquarium's statements are true. As previously mentioned, Seaquarium emphasizes how Lolita is a "*creature of habit*" but her environment is actually subject to regular disturbances such as the aforementioned drops in water level, construction and maintenance noise (including reported jackhammering and work for entire weeks[11]; e.g., 8-10-2009 MSQ9486; 6-1-2009 MSQ9506, etc.; see also my comments for *Anthropogenic Noise*).

Lolita's tank is already too small for her and the above issues further illustrate how her captivity status represents "harm" under the NMFS definition.

Behavior

1. Behavior Ratings

In order to monitor Lolita's activities in the Animal Behavior Records, the Animal Training Manual shows a numeric grading system going from 1 (no response) to 5 (excellent response; Animal Training Manual, page 55, MSQ9764).

I have calculated the average weekly "Behavioral Quality" for different years at random (2001, 2004, 2006), including the most recent years (2013, 2015). The overall average for these years was 3.2 that is slightly above Seaquarium's definition of *average* (BQ=3), as described in the Seaquarium Animal Training Manual. In the Manual (page 55, MSQ9764), *average* is defined as "*the animal responds reliably and generally meets the criteria: energy level is normal and, although errors occur, they are correctable and not severe enough to be disruptive*". Captive killer whales are known to "look forward" to shows (Hargrove 2015) and the Seaquarium represents that Lolita looks forward to her sessions with the trainers, especially shows. However, Lolita's calculated average behavior rating doesn't reflect particular "excitement" toward shows or any other sessions. The records clearly show that "*excellent*" ratings (5), representing

[11] In 2009 alone, maintenance was conducted at Lolita's facility for 26 non-consecutive days over the course of the year.

high energy level and motivation, were given only on rare occasions. Her year-round weekly average rating doesn't seem to show significant differences during Husbandry, Trains, Shows or even Plays or Relationships (note that Sequarium defines Play as: "times during the day when the animal and trainer literally play! It doesn't matter which behaviors occur. There are no expectations of desired behavior from the animal". Seaquarium further defines Relationships as: "This is a very important bonding time between trainer and animal. The animal and trainer will spend time together without asking for any behaviors…").

Further, a Behavioral Quality score of 2 (meaning poor) was often recorded. For example, poor behavior scores were recorded; 116 times in 2001, 132 in 2002, 111 in 2006, 240 in 2009, 93 in 2010, 173 in 2011, 93 in 2012, 134 in 2013 and 192 times in 2015. In the Animal Training Manual (page 55, MSQ9764), poor is defined as "*the animal responds but is sluggish; has a low energy level or is constantly breaking control; frequently refusing S^{d}'s and generally responds at a level below acceptable criteria*"). There are also instances in which Lolita shows several precursors of aggression, low interest/poor attention, or a combination of the two, but she still receives scores of 3 or 4, showing differences and inconsistencies in data collection between trainers and suggesting an overestimation of the rating. In many of the cases in which precursors of aggression were recorded, rakes were also reported on the same or previous day, suggesting a potential correlation between these factors (see examples and specific comments in *Behavior* section).

The "average" score recorded in the reviewed years, the high number of "poor" scores and the almost total absence of "excellent" scores do not agree with Seaquarium statements that portray Lolita as an animal *thriving* (see MSQ10931 document). This suggests that Lolita is not particularly suited to be engaged in the types of sessions at Seaquarium in comparison to other killer whales kept at similar facilities.

2. Precursors of Aggressive Behaviors

Precursors of aggressive behaviors that may indicate impending violence were recorded in high numbers in the Animal Behavior Records[12]. Lolita's behaviors reported by the trainers in the records over several years covered almost the entire list of "warning signs" described in the Seaquarium Animal Training Manual. The most cited precursors of aggressive behaviors displayed by Lolita and found in the records included, among others: head bobbing, tight back or body (tense), fluke or pectoral slapping, mouth open, jaw popping, eyes open widely, ignoring signals, unusual vocalizations, deliberate slow movements, avoidance, and sinking under the surface. These warning signs were recorded - alone and in sequences - during both shows and training, but also during husbandry, plays and relationships.

[12] Facilities keeping killer whales in captivity usually monitor all precursors of aggressions. This implies that their managements are aware that something might go wrong considering the environment in which these free-ranging animals are confined to.

Due to lack of details in data collection, at times it was difficult to understand if the precursor of an aggressive behavior was addressed toward the trainer or the PWSDs, but there are enough instances to support that these warning signs were addressed to both. As an example, in 2006 alone Lolita displayed more than 30 head bobs, in addition to other several other warning signs such as tense (n=35), jaw popping, unusual vocalizations and/or a sequence of the above. In 2009, head bob was recorded 92 times. For several years at random (2001, 2002, 2006, 2009, 2010, 2011, 2012 and 2013), the total number of head bobs was 239. A few of these behaviors were repetitively recorded during a full session or over the course of a day. Head bobbing was frequently reported prior to or during shows. This is known, together with jaw pop, to be one of the most dangerous precursors of aggressions in captive killer whales, and has been found in the records throughout the years. Here are a few random examples from the provided dataset:

- 11-28-2001 MSQ8938: vocal, broke control, head bob, distant;
- 8-20-2001 MSQ8966: head bob at trainer;
- 7-13-2001 MSQ8979: distant, head bob;
- 7-8-2001 MSQ8981: head bob and open mouth, both at trainer in water;
- 8-24-2001 MSQ8967: jaw pop;
- 5-24-2001 MSQ8992: head bob at trainer in water, tense, head bob when trainer left water, broke;
- 12-15-2002 MSQ9041: tense throughout show, excessive nod, not relaxed, exhale twice, broke control during S2;
- 9-9-2002 MSQ9064: long exhale, slow, long head bob, trainer got out, broke control;
- 7-8-2002 MSQ9082: down and then wide eyes, sunk, wide eye again, distant, sunk, wide eye again, turned head during S2; open mouth, distant, during S5;
- 6-24-2002 MSQ9086: tense and big eyes many times during show;
- 1-10-2003 MSQ9139: tense, move head side to side, pump, head bob at trainer, tense twice;
- 1-6-2003 MSQ 9138: head bob at trainer, pushy on trainer in water during S3;
- 2-5-2003 MSQ9146: excessive head bob, very tense, anxious, thrashed head side to side, mouth open;
- 12-15-2004 MSQ 9244: head bob, exhale during same show;
- 5-15-2004 MSQ9307: off position, tense with lags, turned body to trainer in water, off position 2x during same show;
- 6-20-2006 MSQ9398: exhale, threw trainer off, trainer swam out, head bob at trainer, kept head bobbing several times, broke control during same show;
- 3-21-2006 MSQ9424: tense, sunk, broke control during same show;
- 6-5-2006 MSQ9402: head bob, takes off, head bob at trainer during same show;
- 6-6-2006 MSQ9402: broke control, tense during same show;
- 12-25-2009 MSQ9449: head bob, pectoral slaps during same show;
- 11-11-2009 MSQ9460: tense, mouth open, head bob during same show;

- 11-6-2009 MSQ9463: sunk, head bob at trainer, swam around and broke control during same show;
- 7-15-2009 MSQ9494: head bob, pectoral slap, head bob again, vocal in same show; next show head bob and tense;
- 9-13-2009 MSQ9477: head bob, pectoral slap during same show; vocal through the day, pattern swimming;
- 5-3-2009 MSQ9517: tense (and defecated in open), head bob during same show;
- 5-9-2010 MSQ9619: head bob during show;
- 2-2-2010 MSQ9646: head bob during different parts of same show;
- 4-3-2011 MSQ3337-R: tense, head bob when trainer in water, leaning toward lags during same show;
- 10-29-2013 and 10-30-2103 MSQ3480: distant and tense twice, exhale in S2; exhale, turned, exhale in S6; on 10-30: head bob, exhale twice, tense, distant, mouth open in S6;
- 8-10-2013 MSQ3505: head bob, tense, looking toward lags throughout show, excessive h.o.d., tense again;
- 6-19-2014 MSQ3624: vocal in H1, separated by lags; T2 distant; S3 distant, wondered, distant, broke control, pattern swimming, poor positions 2x, pop, vocals;
- 4-26-2014 MSQ3639: exhale, soliciting, jaw pop, head bob;
- 3-2-2015 MSQ3726: head bob during show.

Another dangerous warning of aggression is called jaw pop. This extremely intense precursor of aggression is rarely recorded with trainers working in captivity. By comparison, Lolita jaw popped three times in the year 2001 alone. For a few years at random (2001, 2002, 2006, 2012, 2013, and 2014), the total number of jaw pops was 8.

In the Inspection section I have already discussed the questionable practice of trainers in playing "tug-of-war" with a "wetsuit" in the mouth of Lolita. In the reviewed records, trainers were recorded to be in the water with Lolita (at times with wetsuits as toys or during waterworks) after the animal displayed clear precursors of aggressive behaviors such as head bob, jaw pop, unusual vocals, etc. Here are a few examples:

- 6-19-2012 MSQ3414: head bob in S2; then diver and trainer in water;
- 9-16-2006 MSQ9372: tense and head bob during show, vocal during diving – after: play session with trainer in water;
- 9-19-2006 MSQ9375: excessive head bob at trainer, broke control during show – after: play session with wetsuit and mat with trainer in water;
- 8-30-2006 MSQ9378: mouth open during first show; vocal, head bob at trainer during second show – after: play session with trainer in water;
- 8-15-2006 MSQ9382: jaw pop, poor posture during show – after: trainer in water;

- 5-15-2004 MSQ9307: off position, tense with lags, turned body to trainer, off position 2x during same show (BQ=2); trainer in water during show.

These examples illustrate not only Lolita's frustration with performing tasks, but also the lack of safe practices on the part of trainers by being in the water with Lolita after such clear warning signs, and a lack of the enforcement of consistent safety rules by the Seaquarium management. As Seaword's history clearly teaches us, no one, even the best trainer in the world, can predict the behavior of a killer whale in captivity and when a precursor of aggression might turn into something more.

Throughout the reviewed years, trainers recorded many precursors of aggressive behaviors – sometimes in sequences on the same day or the day after Lolita exhibited rakes inflicted by PWSDs in one or more parts of her body, showing a potential correlation between the two. In these instances, warning signs of aggressions such as head bob, tense, and jaw pop were addressed toward trainers, PWSDs or both. In 2015 alone, Lolita was raked 52 times by PWSDs, this does not include other types of lesions potentially inflicted by the PWSDs (e.g., cuts on tongue) In 2015, she showed signs of new rakes 35 weeks of the year (approximately 66% of the time). There are many instances in which Lolita displayed warning signs of aggressions directly toward the PWSDs (sometimes with the consequence of being separated from them). Here are some examples:

- 3-19-2015 MSQ3722: tense toward lags;
- 5-1-2015 MSQ 3711: tense toward lags;
- 6-19-2015 MSQ3697: tense toward lags;
- 7-1-2015 MSQ3694: tense toward Lag in B;
- 2-18-2012 MSQ3451: tense, head bob in S2, head bob toward lag;
- 11-18-2010 MSQ9564: anxious, tense toward lags;
- 11-8-2010 MSQ9566: tense, vocal, chasing lags during same show; then chasing lags again;
- 9-11-2009 MSQ9477: chased lags, broke control, tense during show, chasing after show;
- 7-3-2009, MSQ9499: tense toward lags twice, chasing lags, broke control during same show;
- 5-16-2009 MSQ9513: tense on lag, exhaled during show;
- 11-2-2006 MSQ9360: during same show: displaced by lags, turned toward lags and open mouth, then head bob at trainer and broke control;
- 11-29-2004 MSQ9248: anxious, tense toward lags, shows and relationships;
- 11-15-2004 MSQ9252: anxious, chasing lags during P, then vocal, head bob twice; also chasing lags throughout the day;
- 5-17-2003 MSQ9175: tense, head bob, poor position during S3; tense, big eyed on lags during S4;
- 9-14-2003 MSQ9209: tense, big eyes toward lags, wandered toward lag station, broke control, etc. during S7;
- 11-8-2001 MSQ8944: head bob in am; chasing lag.

As mentioned, many of these warning signs occurred the same days that Lolita showed new rakes caused by PWSDs, often in her ventral area, as illustrated by some additional examples below:

- 5-5-2015 MSQ3708: tense in training (separation in area B); new lag rakes observed on belly;
- 7-21-2015 MSQ3688: pectoral slap during first show, poor line up, turning, head bob at PWSDs, distant; new lag rakes on stomach, scrape on left side of flukes;
- 4-7-2013 MSQ3541: tense in S2; anxious with lags in S7; bits on tongue;
- 10-20-2010 MSQ9572: tense with Liko; new rakes on belly;
- 6-11-2006 MSQ9403: sinking prior first show; then exhale, head bob in second show; new rakes on ventral side near right pectoral fin;
- 11-30-2004 MSQ9248: anxious, tense during shows; new rakes by genitals and umbilicus;
- 11-25-2004 MSQ9250: exhale twice, vocal during S3, exhale during R4, head bob, off position during S6 (BQ=2.5 for entire day); new rakes to left and above genitals;
- 11-15-2004 MSQ9252: vocal, head bob at trainer twice during same show: chasing through the day; cut in mouth;
- 10-21-2004 MSQ9260: chasing in S3, vocal on lag, tense, head bob, vocal again in S6: new rakes on ventral side near genitals;
- 8-14-2004 MSQ9281: vocals on lags, jaw pop, vocal again; chasing lags through day; 2 ft rakes near genitals, rake near umbilicus left and right side, rake near genitals;
- 11-6-2004 MSQ9257: head bob, exhale during show: new rake on left side about 1 foot long;
- 2-1-2003 MSQ9145: broke control, wondered over to lags station, chased Toki during T1; nudged at trainer, head bob during S2; fast swim into chasing prior to S6; new rakes on ventral side and rakes near umbilicus scar;
- 7-15-2003 MSQ9192: chasing before and at start show, swam away, sunk; new rakes on dorsal fin;
- 10-2-2003 MSQ9214: tense with lags during S2; leaning toward lag, distant, tense; rakes behind dorsal fin, rakes on ventral side above, on left and right side and above genitals, rakes above umbilicus;
- 8-31-2002 MSQ9069: tense during show, off, head bob; 2 ½ inch rakes behind dorsal fin;
- 8-4-2002 MSQ9077: tense, big eye on lag, tense again, distant, vocal; 1 foot long rakes on ventral side;
- 11-29-2001 MSQ8938: chasing lags; rakes on ventral side;
- 8-24-2001 MSQ8967: jaw pop, displaced lags; rakes on umbilicus.

On 109 days in 2004 alone, Lolita was found with one or more rakes (up to 2 ft long), bites, and other lesions on her body (over 30%, n=365).

Lolita was also distracted or displaced by the PWSDs, sometimes giving poor attention to trainers during one or more of the daily sessions. This type of behavior seems related to the presence of rakes on various parts of her body, as shown by some examples recorded in 2015:

- 5-24-2015 MSQ3704: not following trainer along splashguard; open blister, lag rakes on ventral side;
- 7-5-2015, MSQ3694: BQ=2, displaced by lags, off position; two new rakes on belly;
- 7-3-2015 MSQ3695: BQ=2, distant; new rakes above genitals;
- 8-23-2015 MSQ3681: BQ=2 for S3, T4: eye closed, distant, wandered when lags in and swam in B; new rakes on dorsal fin, genitals and belly.

Chasing the PWSDs away was also a sign of annoyance and disturbance displayed by Lolita, as reported by trainers (e.g., low behavioral quality scores, notes in records). It's important to note that "chasing" among individuals in the wild can also be attributed to play, as I observed in my work with dolphins at sea. In the records, however, chasing seems to reflect annoyance or precursors of aggressions by Lolita, as I also observed during Inspection and shown by some examples taken at random:

- 7-21-2013 MSQ3511: jaw pop in S2, gated solo in A in T4, extremely tense in T7 when lags around; tense when lags wandered inS8; chased lags during two shows;
- 7-8-2013: distant, tense toward lags in S2; extremely tense and poor posture in T3; chasing lags;
- 9-11-2009 MSQ9477: chased lags, broke, tense during show; started chasing after show;
- 8-1-2009 MSQ9491: chasing Lii and slapping flukes;
- 8-14-2006 MSQ9382: chasing lags throughout the day;
- 3-13-2006 MSQ9426: wandered and started chasing Lii (gates closed);
- 11-22-2004 MSQ9250: anxious during Lii activities, displaced by lags, chasing all day;
- 9-26-2002 MSQ9060: tense, chase lags, exhale, sunk (also new rakes on ventral side);
- 7-12-2002 MSQ9083: displaced (chased) lags (new rake behind fin).

It's also worth noting that a PWSD named Makani died in Lolita's tank on July 27, 2001. In the Animal Behavior Records, however, there is no mention of how and why this animal died and any relation of this death to Lolita is unknown. There is also no mention whether other PWSDs died in the same tank of Lolita over the reviewed years.

The precursors of aggression displayed by Lolita on a regular basis, year-round and over the course of several years exemplify how this animal survives in constant stressful conditions, often exacerbated by PWSD harassment. These conditions have nothing in common with life in her native environment. Lolita was born and lived, until her capture, in a highly social and complex society in which culturally distinct groups remain together for life. As I have personally witnessed, many species of cetaceans in the wild, including killer whales, have some degree of rake marks. Aggressive

interactions among killer whales, however, are observed only occasionally in nature (NMFS 2008) and scarring by other individuals is present but not frequently observed in this species (Visser 1998[13]), especially compared to what has been documented in captivity. Among wild orcas, raking with teeth is typically something that young individuals do. Residents and transient killer whales can become aggressive with each other when their routes cross, but they usually avoid each other or the residents tend to chase the transients away (Baird 1999). At Seaquarium, Lolita and the PWSDs are forced into a "social reorganization" in an artificial setting that leads to frequent aggression and conflicts. These observations illustrate yet another example of how the Seaquarium is misleading the public by representing and advertising that these animals thrive together as a "*big family*".
It's important to emphasize that the emotional and physical stress that Lolita is subjected to, can weaken her immune system making her more prone to disease (Rose 2011; see also comments in *Health Issues*).

3. Lack of Stimuli & Boredom

In addition to surviving in a concrete, sterile and restricted environment, analyses of the Animal Behavior Records show an overall scarcity of stimuli provided to the animal by trainers during play sessions and a general lack of excitement on the part of Lolita toward playing. In 2015 alone, in a total of 309 play sessions, Lolita was exposed to a hose, wetsuits or both in every session. Other toys were recorded for a total of only 15 sessions (specifically: mat=1, ice=4, toys=7, biggens=3). The use of wetsuits as toys was often reported throughout the reviewed years, especially in recent times. This information is in accordance with what I observed during the inspection in which only wetsuits and a hose were provided as stimuli. During the inspection, Lolita showed only some interest in interacting with either the toys or the trainer. Overall, she seemed distracted and bored, which is a natural reaction for a complex and social animal, otherwise accustomed to be constantly on the move in a natural environment filled with everyday stimuli and interactions.

Signs of Lolita's boredom were frequently reported in the Animal Behavior Records. For instance, Lolita displayed *pattern swimming* in at least 15 instances in 2006, at times during the entire length of one or more sessions and occasionally lasting a full day. Here are some other examples of pattern swimming lasting from half day to consecutive days: 7-10-2004 MSQ9291, 1-21-2006 MSQ9365, 9-28-2006 MSQ9370, 9-24-2006, MSQ9373, 9-13-2009 MSQ9477, 9-5-2009 MSQ9479, 8-12-2009, MSQ9486, 2-15-2009 MSQ9539, 5-3-2013 MSQ3533.

In 2006 alone, she was recorded *sinking* at the bottom of the tank in 25 instances, often prior to or after a show, occasionally looking "distant" or staring in one direction. Another potential reason for Lolita's sinking, in addition to boredom, might be attributed to the high number of rakes found on her ventral area (often near genitals and umbilicus). It is possible that Lolita sunk to the bottom of

[13] In her paper, Dr. Visser concluded that, "*the prolific body scars on the two adult male killer whales appear to be unusual and are the first of their type reported in the literature.*"

the tank to protect her belly, as also observed during the inspection when the PWSDs circulated at close distance above Lolita.

Rubbing (or rubs on her body) was recorded in at least 17 cases in 2006. At times, rubbing appeared to last all day, and this was observed at least 5 times over the years (e.g., 6-28-2009 MSQ9501). Sometimes rub marks were found on the entire body (e.g., 7-6-2002, MSQ9085).

Pattern swimming and rubbing are two examples of obsessive, neurotic and stereotypical behaviors displayed by an animal whose life revolves entirely around being fed. Killer whales in captivity show different signs of boredom and these tend to vary among individuals. Some killer whales are known to grind their teeth against metal, bang their rostra or heads against the sidewalls, regurgitate food or peel paint off the inner walls. Lolita expresses her frustration and boredom by displaying stereotypical behavior such as rubbing and pattern swimming. Some of these behaviors can become obsessive to the point of injury, as also reported in the records (see *Health Issues*). Rubbing teeth against surfaces, for instance, can lead to a pinhole in a tooth that can lead to an abscess and/or infection that could produce pain or even death. The Animal Behavior records report, for instance, an abscess in the right side of the mouth on 2-27-2009 (MSQ9537). It's worth noting that the trainer conducted water work with Lolita the same day she had the abscess (while she was under medication), and stomach samples were collected during husbandry. During this period Lolita appeared tense during both husbandry and training.

Other examples of boredom displayed by Lolita during my inspection are the abnormal and repetitive behavior when she was either lying motionless at the bottom of the tank for extended time, and logging or displaying stereotypical side-to-side head movements. Based on my experience in the field and what I know about these animals in the wild, repetitive stereotypical and obsessive-compulsive behaviors such as those mentioned above are found only in captive animals. I have never observed any form of such "boredom" in wild dolphins and I am not aware of any self-destructive behavior in these animals occurring in nature. Rubbing their rostra on the bottom of the ocean or against objects without purpose or injuring themselves is not something that, in my experience, these animals do.

Watching an orca foraging in the wild is an impressive experience. These animals are remarkable in their ability to cooperate in hunting prey, adapt new feeding strategies according to habitat and food abundance, or pass information to their offspring. The boredom-induced behaviors displayed by Lolita highlight, once again, a chronic frustration in a facility that offers little or nothing to a complex and large brained animal like her.

4. Health Issues

I am introducing this section by stating that I am not a veterinarian so I will limit my comments to some conspicuous issues that raised my concerns about Lolita's welfare at this facility.

Over the years, and especially in recent times, Lolita appeared to be under a constant stream of medications, spanning from eye drops to antibiotics and heavy painkillers. In 2015 alone, there was not a day during the course of the year that she wasn't under one or more medications, and in 2014 she was given medicine every day of the year except for four days. Killer whales in the wild do not need human-made medications and their life span is longer than that of their captive counterparts. Consequently, I question her health status considering she appears to be, for one reason or another, constantly medicated.

The Animal Behavior Records cite a long list of Lolita's physical and health issues observed over the years including, among others: scratches, rakes, scrapes, blisters, rubs, cuts, bumps, bites, bruises, dry skin and cracks, sores, wrinkles, abrasions, eye issues, skin discolorations, papilloma, drilled and fractured teeth, abscess in teeth, diarrhea, vomit, blowhole problems, etc.

The many rakes imposed by the PWSDs on Lolita's body on a year-round basis over many years (see *Precursors of Aggressive Behaviors*) are likely to keep this animal under emotional and physical stress and continuous guard. The rakes are one reason for keeping her under a series of medications spanning from honey to antibiotics and painkillers. Seaquarium states "*animals develop superficial ('rake') injuries as part of their normal behavior and activities*" (MSQ4800) but this statement is incorrect considering that: a) rakes are not always superficial, as reported by bleeding and medical treatments in the records, and b) this is not "normal" behavior because PWSDs and killer whales would never have these types of regular interactions in nature. These are issues brought about by the forced co-existence of two incompatible species in a totally unnatural environment. As previously mentioned, free-ranging animals are able to avoid confrontations with their conspecifics as well as other species.

In addition to rakes there are rubs, sores and abrasions often observed on her body. The presence of some of these lesions is certainly related to the lack of space in the tank subjecting Lolita to repetitive and obsessive behaviors that tend to injure her. Flukes dragging at the bottom of the tank (observed during the inspection) and other parts of the body such as rostrum and pectoral fins continuously in contact with concrete surfaces, because of the restricted area she is forced to move in, are also a cause of abrasions and sores. Honey and various drugs are often mentioned in the records and used by Seaquarium staff to heal these lesions and/or prevent infections. Medicines, however, are not the solution to the problems. Dry, wrinkled and cracked skin was also frequently recorded in the records (e.g., 4-2-2006, MSQ9423, 4-3-2006 MSQ9420, 3-26-2013 MSQ3542 – also cloudy eyes, 3-30-2013 MSQ3543, 3-9-2013 MSQ3549, 11-20-2012 MSQ3372, 6-17-2012 MSQ3417,

4-12-2012 MSQ3434, 3-23-2012 MSQ3441, 10-18-2001 MSQ8950, 9-9-2001 MSQ8963), likely as a consequence of her constant exposure to sun radiation and the total absence of shade.

Lolita also seems to have many problems with her eyes, especially in recent years, with one or both eyes kept shut during shows (this happened on at least 14 different occasions in 2015 alone). For instance, she was given eye drops every single day in 2015 and every day of 2014 except 4 days, (often twice daily). Below are a few examples when eye complications were recorded:

- 3-15-2015 MSQ3724: right eye closed;
- 8-21-2015, 8-23-2015 MSQ3681: eyes closed;
- 7-30-2105 MSQ3686: eye closed;
- 7-31-2015, 8-1-2015 MSQ3687: eye squinty and cloudy;
- 9-6-2014 MSQ3601: eye shut;
- 2-28-2014, 3-1-2014, MSQ3655: alternating eyes closed during shows; rub on eye;
- 1-10-2014 MSQ3669: eye shut;
- 1-11-2013 MSQ3565: white line left eye;
- 11-30-2013 MSQ3473: white in left eye;
- 11-4-2013 MSQ3379: right eye cloudy;
- 8-9-2013 MSQ3505: right eye cloudy, eyes squinty;
- 11-25-2012, 11-26-2012, MSQ3370, MSQ 3373: line in left eye:
- 7-10-2012, 7-11-2012 MSQ3408: white line in eye; cloudy eye;
- 3-17-2012: line in left eye;
- 6-12-2012 MSQ3416: left eye cloudy;
- 11-26-2012 MSQ3370: white line in left eye;
- 7-10-2012, 7-11-2012 MSQ3408: white line in left eye; cloudy right eye;
- 11-22-2011 MSQ3268: white line in left eye;
- 10-2-2011 MSQ3285-R: eye cloudy;
- 3-10-2010, 3-5-2010, 2-27-2010, MSQ9636, 9639,9641: white spot in left eye;
- 5-18-2009, 5-20-2009, MSQ9510: right eye shut, eye squinty;
- 3-13-2009 MSQ9531: left eye cloudy;
- 6-30-2002 MSQ9087: right eye closed during day;
- 10-26-2001 MSQ8949: eye closed; right eye closed on and off through day;
- 10-3-2001, 10-4-2001 MSQ8954: right eye shut; right eye mostly closed.

Eye drops are often given to captive dolphins to help them with either chemicals in the water or sun damage. There is no doubt that Lolita is exposed to both, living in a tank deprived of any sun protection and being subjected to chlorine on a daily basis for the last 45 years. Watching Lolita during the inspection, lying at the bottom of the tank close to what seems an outflow valve (likely introducing concentrations of highly chlorinated water) raises even more concerns about the health

of her eyes. As mentioned above, there were several instances when shows have been carried out even though Lolita wasn't able to keep her eyes open. This disregard for Lolita's well being was also present in several records in which shows were conducted even when she was likely in pain. Here are just a few examples:

- 8-21-2015, 8-23-2015, MSQ3681: eyes closed during entire show;
- 7-30-2105 MSQ3686: eye closed during show;
- 9-6-2014 MSQ3601: eye shut during show;
- 8-2-2014 MSQ3611: eye shut during all sessions;
- 2-28-2014 MSQ3655: alternating eyes closed during shows;
- 8-15-2013 MSQ3502: eye shut during shows;
- 2-27-2009 MSQ9537: abscess in right side of mouth; two shows and full sessions carried out with trainer in water; also some evident precursors of aggression (tense);
- 5-18-2009, 5-20-2009 MSQ9510: right eye shut, eye squinty; shows both days;
- 10-26-2001 MSQ8949: eye closed during show; right eye closed on and off through day;
- 10-3-2001, 10-4-2001 MSQ8954: right eye shut or mostly closed; shows all day.

In 2011, Lolita had drilling in one or more of her teeth (the records do not specify which tooth or how many) for five days (4-19 to 4-21 and 4-14 and 4-15) in April and then three days (5-2 to 5-5), then for five days in a row (5-9 to 5-13) in May. The drilling took place on the same day that she was performing shows. On 4-21-2011 (MSQ330-R), not only were her teeth drilled but stomach and blood samples were also taken. On this date, she was required to perform and she head bobbed at the trainer.

Based on the reviewed records, the above-mentioned lesions, eye and tooth problems are just a few examples of the many health issues this animal faces regularly at this facility (see Veterinary report for a complete analysis). The Seaquarium often states "*Lolita is active and healthy as ever, a true statement of her care*" (e.g., document MSQ10937) but the regular presence of one or more physical problems, the constant use of medications, and the limited level of activity noted during the inspection and analyses of the records show the contrary. Female killer whales, contrary to what is written in the MSQ Animal Training Manual (p.14), can live up to 80 or 90 years in the wild[14]. The fact that Lolita is still alive at age 51 is not a testimony of her good health or her good care but rather her age demonstrates the tenacity of this animal to survive against all odds despite truly poor captive conditions.

[14] This life expectancy of killer whales in the wild surpasses what has been observed in captivity where the majority of these animals die before their early 20s (for a review: Rose 2011, Barrett-Lennard and Heise 2011). Survivorship data reported in the MSQ Animal Training Manual (p.14) are also incorrect considering that mortality rate of captive killer whales is at least two and a half times as high as that of their wild counterparts (for a review: Rose 2009).

My findings from review of the MSQ documents are in accordance with my observations at the Seaquarium facility conducted January 20, 2016.

The Seaquarium stresses that "*what's important to Lolita's well being is her quality of life* (MSQ10853). My review, however, reveals a poor quality of life and shows how her captive status at Seaquarium doesn't address the basic needs of a killer whale.

4. Conclusions

Killer whales are one of the most social mammals on Earth. Lolita's confinement without conspecifics is profoundly detrimental from a biological, ecological and psychological perspective. The conditions in which Lolita is kept are not acceptable for any large marine mammal species, especially for one under the protection of an ESA-listing.

Enclosing animals in small spaces in species such as killer whales, which range widely in the open ocean, tends to induce boredom, stress, abnormal behaviors and psychological dysfunctions (Clubb and Mason 2003, Couquiaud 2005, Wemelsfelder 2005). Lolita's confinement in Seaquarium's undersized and sun-exposed tank significantly disrupts her normal and essential behavioral patterns. Moreover, Lolita's forced co-existence with two Pacific white-sided dolphins is detrimental not only to her physical health but also to her psychological status as discussed in this review.

Any one of the findings discussed herein would constitute a reasonable cause for releasing Lolita from the Seaquarium. The cumulative effect of all my findings certainly makes a strong case for her release from this facility.

Declaration

Pursuant to 28 U.S.C. § 1746, I, Maddalena Bearzi, hereby declare that under the penalty of perjury the contents of the foregoing report are true and correct to the best of my knowledge.

EXECUTED on this 8th day of February 2016

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Whitehead, H., and Rendell, L. 2015. *The Cultural Lives of Whales and Dolphins.* Chicago University Press, Chicago, IL.

APPENDIX A

Curriculum Vitae

MADDALENA BEARZI — CURRICULUM VITAE

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Marina del Rey, California 90295 · USA
e-mail: mbearzi@earthlink.net

EDUCATION

POSTDOCTORAL FELLOW, ECOLOGY & OUTREACH EDUCATION — 2003 – 2004
University of California — *Los Angeles, California*
Curriculum development for ecological studies

Ph.D., BIOLOGY — 1998 – 2003
University of California — *Los Angeles, California*
Dissertation: Ecology of marine mammals in Santa Monica Bay, California

BACHELOR OF SCIENCE DEGREE IN NATURAL SCIENCE — 1985 – 1989
University of Padova — *Padova, Italy*
Thesis: Home range and homing of *Podarcis sicula campestris* De Betta, 1857 (*Reptilia, Lacertidae*) in the Tombolo Natural Reserve (Pisa, Italy)

MAJOR PROFESSIONAL INTERESTS

Education, Public Awareness and Capacity Building Action to Promote Conservation of Marine Resources
Popular Science Writing & Photo-Journalism
Marine Mammal & Sea Turtle Ecology, Conservation and Management

EXPERIENCE IN ECOLOGY, CONSERVATION & EDUCATION

OCEAN CONSERVATION SOCIETY — WINTER 1998 – PRESENT
Co-Founder and President — *Los Angeles, California*
Conducting marine mammal research on different species of cetaceans and pinnipeds; conducting educational programs on environmental issues; obtaining funding for ocean related projects; increasing public awareness of environmental problems facing marine and other ecosystems through development and dissemination of educational materials, curricula, lectures, workshops, reports, etc; providing student programs, on-the-water internships and mentorships for experiences in field research and in-depth look at the anthropogenic effects on our environment; training research assistants and volunteers.

OCEAN TECHNOLOGY & ENVIRONMENTAL CONSULTING — 2009- 2011

Consultant *San Francisco, California*
Advised on different aspects of ocean science, marine research and environmental problems; also provided consulting for scientific writing.

UNIVERSITY OF SOUTHERN CALIFORNIA 2002 – 2004
Visiting Student *Los Angeles, California*
Conducted a comparative study on dolphins and African apes sympatric ecology.

ENVIRONMENTAL SYSTEMS RESEARCH INSTITUTE JUNE 2000, JUNE 2007
Credited student *Redlands, California*
Participated in ESRI course encompassing practical scientific application of Arcview GIS and ArcGIS.

TETHYS RESEARCH INSTITUTE/EUROPE CONSERVATION 1991 – 1999
Director and Principal Investigator, Yucatan Project *Yucatan, Mexico*
PI for study the ecology of sea turtles and dolphins in the Rio Lagartos and the El Palmar Reserves (Yucatan, Mexico); built local awareness and capacity for marine and land conservation through education and outreach programs; developed guidelines for protection of sea turtles; trained research assistants, conducted lectures and field research; authored technical reports, conservation work plans and funding proposals.

MARINE TURTLE CONSERVATION AND RESEARCH PROGRAM (CHELON) 1992 – 1998
Vice-President, Chelon *Rome, Italy*
Co-directed a non-profit organization dedicated to conservation and management of sea turtles; increased public awareness of problems facing marine reptiles through lectures, research as well as development and dissemination of educational and conservation programs.

TETHYS RESEARCH INSTITUTE 1990 – 1998
Principal Investigator *Milan, Italy*
Conducted marine mammal research on different species of dolphins and whales in the Mediterranean sea and in the Caribbean Sea; trained research assistants and volunteers for field work; lectured on various topics; wrote newsletters on research and environmental issues.

UNIVERSITY OF PADOVA 1989 – 1990
Research Assistant, Environmental Analysis Program *Padova, Italy*
Conducted and managed environmental impact studies in Northern Italy.

UNIVERSITY OF PARMA 1986 – 1991
Research Assistant *Parma, Italy*
Conducted ecological and conservation investigations on reptiles and birds in Tuscany and Sardinia, Italy.

TEACHING EXPERIENCE

UNIVERSITY OF CALIFORNIA — SPRING 2010
Lecturer, UCLA Extension (Workshop on Great Apes and Dolphins)
Los Angeles, California

UNIVERSITY OF CALIFORNIA — WINTER 2007, SUMMER 2009
Lecturer, UCLA Extension (Workshop on Marine Mammals)
Los Angeles, California

UNIVERSITY OF CALIFORNIA — SPRING 2006
Lecturer, UCLA Extension (Oceans: New Frontiers)
Los Angeles, California

UNIVERSITY OF CALIFORNIA — WINTER 2003 – 2004
Lecturer, UCLA Extension (Dolphins, Whales and Seals: The Fascinating World of Marine Mammals and their Conservation)
Los Angeles, California

UNIVERSITY OF CALIFORNIA — WINTER 2003 – 2004
Scientific Supervisor, OBEE 199I (Independent Projects)
Los Angeles, California

UNIVERSITY OF CALIFORNIA — FALL 2003, 2004
Lecturer, OBEE C109 (Introduction to Marine Biology)
Los Angeles, California

UNIVERSITY OF CALIFORNIA — SPRING 2003 – 2004
Scientific Supervisor, OBEE 195 (Independent Projects)
Los Angeles, California

UNIVERSITY OF CALIFORNIA — WINTER 2002 – 2003
Lecturer, OBEE 98T (Marine Mammals: Their Ecology and Conservation)
Los Angeles, California

UNIVERSITY OF CALIFORNIA — SPRING 2001– 2002
Scientific Supervisor, OBEE 199I (Independent Projects)
Los Angeles, California

UNIVERSITY OF CALIFORNIA — SPRING 2000 – 2001
Teaching Assistant, OBEE 25 (Oceans)
Los Angeles, California

UNIVERSITY OF CALIFORNIA — SPRING 1999 – 2000
Teaching Assistant, Life Science I
Los Angeles, California

UNIVERSITY OF CALIFORNIA FALL 1999 – 2000
Teaching Assistant, OBEE 123, 102, 148, 163 (Marine Biology Quarter)
Oahu, Hawaii

OTHER EXPERIENCES

POPULAR SCIENCE WRITER

- *"Beautiful Minds: The Parallel Lives of Great Apes and Dolphins", co-authored with C. Stanford. Harvard University Press (2008; paperback 2010)*
- *"Dolphin Confidential: Confessions of a Field Biologist". Chicago University Press (2012)*

PHOTO-JOURNALIST

Author of over 380 popular science, nature, and conservation articles for European and American magazines and newspapers.

Official blogger for the National Geographic – Ideas and Insight from Explorers (http://voices.nationalgeographic.com/author/mbearzi/).

TV ENVIRONMENTAL REPORTER

Environmental correspondent for Rai 3 (*King Kong: Un Pianeta da Salvare*), one of three main Italian TV networks.

Articles and books have been covered, among others, by CNN, KPCC, PRI, CBS2/KCAL9, NBC4, Hallmark Channel, Los Angeles Times, New Scientist, and American Scientist.

PROFESSIONAL AFFILIATIONS

All American Speaker Bureau	2012 – PRESENT
Dolphin Biology & Conservation, Research Team	2011 – PRESENT
Southern California Marine Mammal Workshop/ Advisory Committee Member	2011 – PRESENT
American Cetacean Society/LA Scientific Advisory Board Member	2009 – PRESENT
UCLA Alumni Association Life Honorary Member	2002 – PRESENT
Society of Marine Mammalogy Member	2001 – PRESENT
Ordine dei Giornalisti dell'Umbria	1998 – 2014

FELLOWSHIPS, GRANTS & AWARDS

This list is not all-inclusive; City of Los Angeles certificate of commendation for outstanding work; Santa Monica Bay Restoration Commission Grant; Professional Development Award, UCLA; UCLA Postdoctoral Fellowship; Dr. Thomas James Memorial Fund Award; Alumni Association Award, Outstanding Graduate Student and Chancellor's Service Award (Life Membership - UCLA Alumni Association); Collegium of University Teaching Fellows; OBEE Department Research Grant Support; Charles E. and Sue K. Young Graduate Student Award; Coastal Environmental Quality Initiative Fellowship; OBEE Department Research Grant Support; Fishbaug Scholarship

and Adopt-a-Scholar; The Affiliates UCLA, Research Mentorship Fellowship, University of California, L.A.; Santa Monica Bay Restoration Project, educational grant; Award of Fellowship Support for the 1999-2000 academic year, UCLA; ESRI grant; American Cetacean Society.

INVITED PARTICIPATION IN SEMINARS, CONFERENCES & SUMMITS

2016	Invited Keynote Speaker, Southern California Marine Mammal Workshop, Newport, CA
2014	Invited Speaker, National Museum of Animals & Society, Los Angeles, CA
	Invited Speaker, University of Redlands, Los Angeles, CA
	Invited Speaker, Redondo Beach Yacht Club, Los Angeles, CA
	Invited Speaker, Long Beach Yacht Club, Long Beach, CA
	Invited Seminar Speaker, University of California, Los Angeles, CA
	Invited Speaker, Lakeside School, Seattle, WA
	Panel Leader, Southern California Marine Mammal Workshop, Newport, CA
	Invited Lecturer, Moorpark College, Moorpark, CA
2013	Panel Leader, Southern California Marine Mammal Workshop, Newport, CA
	Invited Speaker, Natural History Museum of Los Angeles, CA
	Invited Lecturer, Moorpark College, Moorpark, CA
2012	Invited Speaker, Harvard Museum of Natural History, Cambridge, MS
	Invited Guest, White House Summit on Environmental Education, Washington D.C.
	Invited Speaker, New England Aquarium, Boston, MS
	Invited speaker, Monterey Bay Aquarium, Monterey Bay, CA.
	Invited Panelist, Southern California Marine Mammal Workshop, Newport Beach, CA
	Invited Speaker, Santa Monica Aquarium, Santa Monica, CA
	Invited speaker, American Cetacean Society, San Pedro, CA
	Invited Speaker, G2 Gallery, Venice, CA
	Invited Speaker, Long Beach Aquarium, Long Beach, CA
	Invited Speaker, Commonwealth Club, San Francisco, CA
	Invited Speaker, Santa Monica Library, Los Angeles, CA
	Invited speaker, Heal The Bay Aquarium, Santa Monica, CA
	Invited speaker, Thousand Oaks Library, Thousand Oaks, CA.
2011	Invited speaker, Loyola Marymount University, Los Angeles, CA
	Invited Panelist, Southern California Marine Mammal Workshop, Newport Beach, CA
2010	Guest of honor, Veterinarian Conference, Tenerife, Canary Islands
	Invited speaker, Scripps Institute of Oceanography, La Jolla, CA
	Invited speaker, American Cetacean Society, San Pedro, CA
2009	Invited speaker, Caltech University, Pasadena, CA
2008	Invited speaker, American Cetacean Society, San Pedro, CA
	Invited speaker, Museum of Natural History of Los Angeles, Los Angeles, CA
	Invited speaker, Skidaway Institute, Savannah, GA
2007	Invited speaker, California State University, Long Beach, CA
2006	Invited speaker, SCCRWP, Los Angeles, CA

2005	Invited speaker, Santa Monica Bay Restoration Commission, Los Angeles, CA
	Invited speaker, Los Angeles Zoo, Los Angeles, CA
	Invited speaker, American Cetacean Society, San Pedro, CA
2004	Invited speaker, Behavioral Ecology Monthly Meeting, UCLA, Los Angeles, CA
2003	Invited lecturer, COSEE WEST (UCLA & USC lecture series), Los Angeles, CA
2002	Invited lecturer, OBEE 98T, UCLA, CA
2001	Invited speaker, Museum of Natural History of Los Angeles, Los Angeles, CA
2000	Invited lecturer, OBEE Ocean 25, UCLA, CA
	Invited lecturer, University of Southern California, Marine Biology Seminar, Los Angeles, CA
1999	Invited speaker, American Cetacean Society, San Pedro, CA
1997	Invited speaker, OTS-Roundhouse Aquarium, Manhattan Beach, CA
1996	Invited speaker, Tethys Research Institute, Milan, Italy

BOOKS & PEER-REVIEWED PUBLICATIONS

Fandel, A., M. Bearzi, and T. Cook. 2015. Effects of ocean recreational users on coastal bottlenose dolphins (*Tursiops truncatus*) in the Santa Monica Bay, California. Bulletin of the Southern California Academy of Sciences, 114(2):63-75.

Cook, T., K. James, and M. Bearzi. 2015. Angler perception of California sea lions (*Zalophus californianus*) depredation and marine policy in Southern California. Marine Policy Journal 51:573-583.

Hwang, A., R.H. Defran, M. Bearzi, D. Maldini, C.A. Saylan, A.R. Lang, K.J. Dudzik, O.R. Guzòn-Zatarain, D.L. Kelly, and D.W. Weller. 2014. Coastal Range and Movements of Common Bottlenose Dolphins (*Tursiops truncatus*) off California and Baja California, Mexico. Southern California Academy of Sciences Bulletin 113(1):1-13.

Bearzi, M. 2012. Dolphin Confidential: Confessions of a Field Biologist. Chicago University Press.

Bearzi, M. 2012. Cetaceans and MPAs should go hand in hand: a case study in Santa Monica Bay, California. Ocean & Coastal Management 60: 56-59.

Bearzi, M. and C. Saylan. 2011. Cetacean ecology for Santa Monica Bay and nearby areas, California, in the context of the newly established MPAs. Southern California Academy of Sciences Bulletin 110(2): 35-51.

Bearzi, M. and C.B. Stanford. 2010. A Bigger, better brain. American Scientist 98:2-9.

Bearzi, M. and K. Patonai. 2010. Occurrence of the barnacle (*Xenobalanus globicipitis*) on coastal and offshore common bottlenose dolphins (*Tursiops truncatus*) in Santa Monica Bay and adjacent areas, California. Southern California Academy of Sciences Bulletin 109(2):15-22.

Bearzi, M., C. Saylan, and J. Feenstra. 2009. Seabird observations during cetacean surveys in Santa Monica Bay, California. Southern California Academy of Sciences Bulletin 108(2):63-69.

Bearzi, M. 2009. Dolphins in the water off California. Pp. 116-117 In: Thoreau's Legacy: American Stories about Global Warming. R. Hayes, ed. Union of Concerned Scientists/Penguin Classics, Cambridge, MA.

Bearzi, M., C. Saylan, and A. Hwang 2009. Ecology and comparison of coastal and offshore bottlenose dolphins (*Tursiops truncatus*) in California". Journal of Marine and Freshwater Research 60(6):584-593.

Bearzi, M., S. Rapaport, J. Chau, and C. Saylan. 2009. Skin lesions and physical deformities of coastal and offshore common bottlenose dolphins (*Tursiops truncatus*) in Santa Monica Bay and adjacent areas, California. Ambio 38(2):66-71.

Bearzi, M. and C. Saylan. 2008. A hand-held, PDA based system for seabird data collection during cetacean surveys. Journal of Marine Animals and Their Ecology (1)1:9-11.

Bearzi, M., C. Saylan, and C. Barroso. 2008. Pinniped ecology in Santa Monica Bay, California. Acta Zoologica Sinica 54(1):1-11.

Bearzi, M. and C.B. Stanford. 2008. Beautiful Minds: The parallel Lives of Great Apes and Dolphins. Harvard University Press. 351 pp.

Bearzi, M. and C.B. Stanford. 2007. Dolphins and African apes: comparisons of sympatric socio-ecology. Contributions of Zoology 76(4):235-254.

Navarro, M.O. and M. Bearzi. 2007. Affect of Marine Mammals on Sport Fishery in the Santa Monica Bay, California. Southern California Academy of Science Bulletin 106(3):215-217.

Bearzi, M. 2006. California sea lions use dolphins to locate food. Journal of Mammalogy 87(3):606-617.

Bearzi, M. 2005. Habitat partitioning by three species of dolphins in Santa Monica Bay, CA. Southern California Academy of Science Bulletin 104(3):113-124.

Bearzi, M. 2005. Dolphin sympatric ecology. Marine Biology Research 1:165-175.

Bearzi, M. 2005. Aspects of the ecology and behaviour of bottlenose dolphins (*Tursiops truncatus*) in Santa Monica Bay, California. Journal of Cetacean Research and Management 7(1):75-83.

Bearzi, M. 1996. Sea turtles in the El Palmar Reserve, Yucatan: A preliminary study. Marine Turtle Newsletter, 75:18-20.

Politi, E., M. Bearzi, G. Notarbartolo di Sciara, E. Cussino and G. Gnone. 1992. Distribution and frequency of cetaceans in the waters adjacent to the Greek Ionian Islands. European Research on Cetaceans, 6:75-78.

THESES, REPORTS, ETC.

Bearzi, M., D. Checkley, D. Caron, M. Dojiri, J. Gully, C. Lowe, and E. Miller. 2015. State of the Bay Report. Habitat Conditions: Coastal Pelagic. Urban Coast 5(1): 116-127.

Fandel, A., M. Bearzi, and Cook, T. 2014. Angler perceptions of California sea lion (*Zalophus californianus*) depredation and marine policy in Southern California, CA. Abstract, American Cetacean Society, November 8-10, Newport, CA.

Cook, T., James, K., and Bearzi, M. 2014. Effects of ocean recreational users on coastal bottlenose dolphins (*Tursiops truncatus*) in the Santa Monica Bay, California. Abstract, Workshop on Marine Mammals, Newport, California, January 31-February 1, 2014.

Szczepaniek, I., Keener, W., Webber, M., Stern, J., Maldini, D., Cotter, M., Defran, R.H., Rice, M., Campbell, G., Debich, A., Lang, A.R., Kelly, D.L., Kesaris, A., Bearzi, M., Causey, K., and Weller, D.W. 2014. Bottlenose dolphins range north to San Francisco. Abstract, Workshop on Marine Mammals, Newport, California, January 31-February 1, 2014.

Kesaris, A., Weller, D., Campbell, G., Defran R.H., Bearzi, M., Maldini, D., and J. Hildebrand. 2013. California Dolphin Online Catalog. Abstract, American Cetacean Society, October 31, 2013.

Barroso, C. and Bearzi, M. 2013. Ecology of Risso's dolphins in Santa Monica Bay and nearby areas. Abstract, Workshop on Marine Mammals, Newport, California, February 1-2, 2013.

Bearzi, M. 2012. Photo-identification of skin diseases. Abstract, Workshop on Marine Mammals, Newport, California, February 3-4, 2012.

Bearzi, M. 2012. Marine mammals and MPAs in Santa Monica Bay, CA. Abstract, Workshop on Marine Mammals, Newport, California, February 3-4, 2012.

Hwang, A., Defran, RH., Bearzi, M., Maldini, D., Saylan, C.A., Lang A.R., Dudzik, K.J., Guzon-Zataran, O.R., Kelly, D.L., and Weller, D.W. 2012. Range characteristics and movements patterns of Pacific coast common bottlenose dolphins. Abstract, Workshop on Marine Mammals, Newport, California, February 3-4, 2012.

Bearzi, M. 2009. Sea lions and dolphins in Santa Monica Bay, CA. Abstract, Workshop on Marine Mammals, Newport, California.

Bearzi, M. 2009. Sea lions and dolphins in Santa Monica Bay, CA. Abstract, Workshop on Marine Mammals, Newport, California.

Bearzi, M. 2005. Do sea lions follow dolphins to enhance their foraging success? Abstract, Proceedings of The XV Biennial Conference on the Biology of Marine Mammals, December 12-16, San Diego, California.

Bearzi, M. 2003. Behavioral ecology of the marine mammals of Santa Monica Bay, California. Ph.D. Dissertation, University of California, Los Angeles. 239 pp.

Bearzi, M. 2001. Observations on two species of common dolphins in the Santa Monica Bay, CA. Abstract, Proceedings of The 15th Annual Conference of the European Cetacean Society, May 6-10, Rome, Italy.

Bearzi, M. 2001. Observations on two species of common dolphins in the Santa Monica Bay, CA. Abstract, Biology Research Symposium, UCLA Department of Organismic Biology, Ecology, and Evolution, May 14, Los Angeles, CA.

Bearzi, M. 2001. Spatial habitat partitioning between three dolphin species in Santa Monica Bay, CA. Abstract, Proceedings of The XIV Biennial Conference on the Biology of Marine Mammals, November 28-December 4, Vancouver, British Columbia, Canada.

Bearzi, M. 2000. First contribution to the knowledge of marine mammals in the Santa Monica Bay, California. Biology Research Symposium, Department of Organismic Biology, Ecology, and Evolution, University of California, May 9, 2000, Los Angeles, CA.

Bearzi, M. and B. Steinmetz. 2000. Preliminary observations on marine mammals in the Santa Monica Bay, California. Abstract, Southern California Academy of Science, 2000 Annual Meeting, May 19-20, 2000, Los Angeles, CA.

Bearzi, M. 1999. The Los Angeles Dolphin Project. Preliminary Report, Santa Monica Bay Restoration Project. 2 p.

Bearzi, M. 1999. Data on marine mammals collected during inshore surveys in the Santa Monica Bay, California. Preliminary Report, Chambers & Ass. 8 p.

Bearzi, M. 1999. Preliminary observations on marine mammals in the Santa Monica Basin, California. Abstract, Proceedings of The XIII Biennial Conference on the Biology of Marine Mammals, November 27-December 3, Maui, Hawaii.

Bearzi, M. 1996. Sea turtles survey to evaluate the human impact in the influence area of salt extraction industry (Rio Lagartos, Yucatan, Mexico). Final Report, Industria Salinera de Yucatan, Mexico. 5 p.

Bearzi, M. 1996. The El Palmar Project in the Yucatan Peninsula. Universitad Campechana, IX Taller Regional sobre Programas de Conservacion de Tortugas Marinas en la Peninsula de Yucatan, 7-10 February 1996, Campeche, Mexico.

Bearzi, M. 1996. Bottlenose dolphins in El Palmar and Rio Lagartos Reserves (Yucatan, Mexico): a preliminary study. Proceedings of The American Cetacean Society Conference, 8-11 November 1996, San Pedro, CA.

Bearzi, M. 1992-93. The Yucatan sea turtle project. Tethys Research Institute Technical Report TRI 94-01: 8.

Bearzi, M. 1991. Il programma vertebrati. Proceedings 12th National Conference of the Scientific Museum Italian Society. Pordenone, Italy, 31 May-2 June, 1991.

Bearzi, M. 1989. Osservazioni sull'estensione dell'home range e sulle capacità di homing in *Podarcis sicula campestris* De Betta, 1857 (*Reptilia, Lacertidae*) all'interno dell'area di Tombolo (Pisa). Tesi di laurea in Scienze Naturali. Università degli Studi di Padova. 145 pp.

Foà, A., M. Bearzi and N.E. Baldaccini. 1989. Homing and home range in *Podarcis sicula* (*Reptilia, Lacertidae*). Proceedings 13th Symposium of the Italian Ethology Society. Perugia, Italy, 19-22 May, 1989.

APPENDIX B

Statement of Compensation

My fee schedule is as follow:

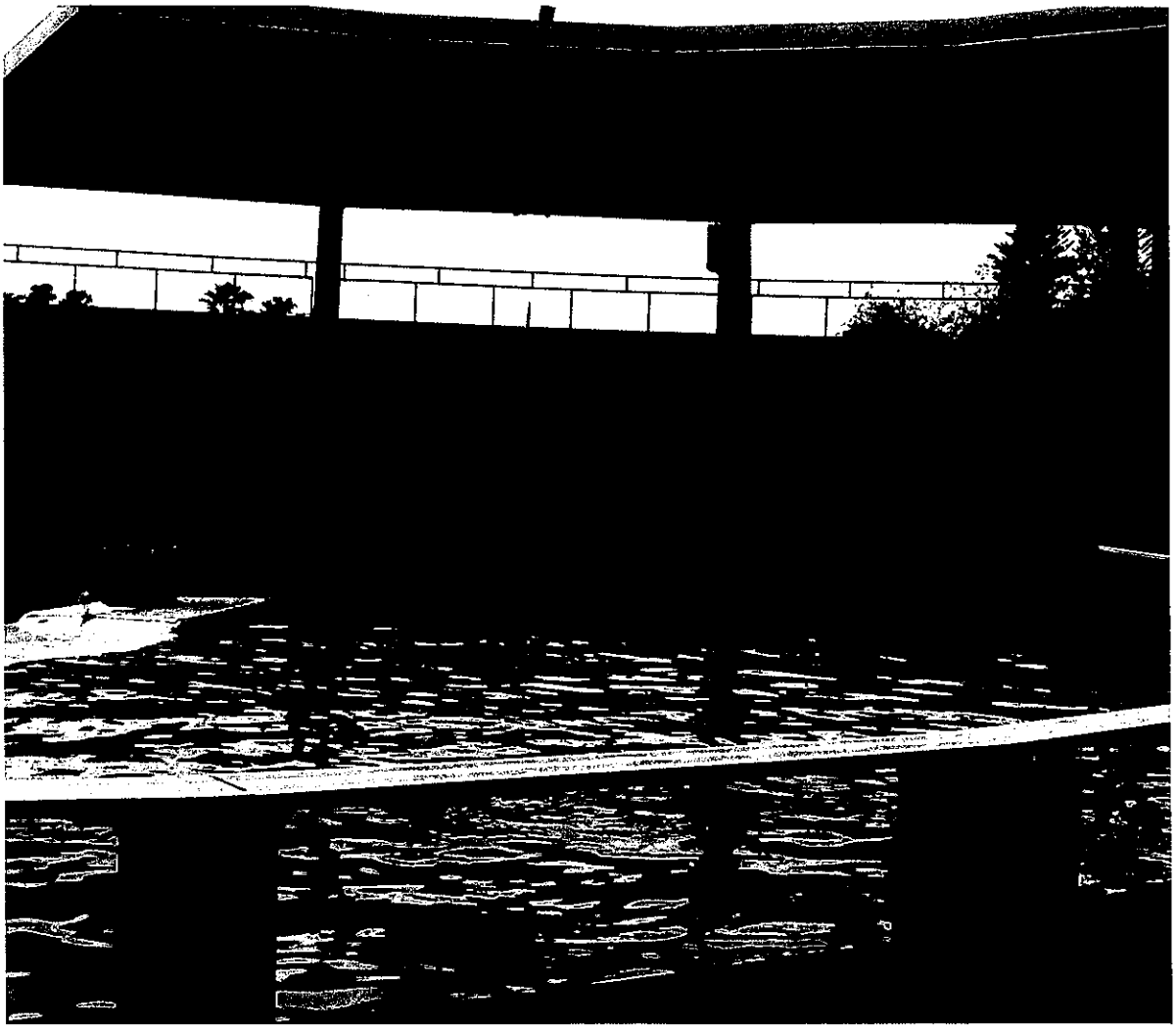
- billing rate for reviewing documents, consulting, testimony and other relative work is $90.00 per hour
- travel expenses (lodging, meals, etc.) are paid based on submitted receipts
- a flat fee of $650 per diem is paid during traveling

APPENDIX C

Participation in Legal Cases

I have not been involved in other cases as an expert at trails or by deposition in the last 4 years.

Exhibit A



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